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Intermediate Examination Papers,

ENGLISH

FIRST PAPER

Prose

Section A *should be attempted, and either Section*
B *or Section* C, *but not both of these sections.*

(The answers to Section A *should be written in
book marked I ; those to Sections* B *or* C *in book
marked II).*

Section A

1. Bring out the full meaning of the italicised
portions in the following extracts:—

(a) These passages illustrate also *his faculty
of looking through and beyond the passing clouds
of adverse circumstance and accidental failure*
by which men are also easily blinded and dispir-
ited, and of fixing his eyes steadily on the main
chances and essential conditions of success He
saw not only the sea of troubles which encom-
passed the English in India, but *the calm and open
waters* that were to be reached by resolute and
skilful navigation. So long as he could *keep the
vessel's head straight on the point to which he
had set her,* neither waves nor wind, or a mu-
tiny on board, *could wrench the helm from his
straining hands.*

(b) The feud between the Governor-General
in Council and the Judges in Calcutta arose

inevitably out of the vague character of the Court's jurisdiction, as expressed in the Act and the Charter. *The wording of these instruments reflected the hesitation and irresolution of the legislators*, who were in truth unable to make up their minds upon certain *cardinal points*, because they were not yet prepared by accurate knowledge of facts or by experience to undertake the construction of a scheme of judicature adapted to *the peculiar needs of a situation that had no precedent* in the constitutional history of the kingdom. In the first place, the provinces of the executive Government and the Supreme Court respectively were left *without clear demarcation*, and every communication between them left each party *in a highly electrical condition*. The Court heard that the Council had recorded on their minutes *something disparaging to their body*, and demanded a copy of the record.   ,

(c) In 1793 the trial was resumed with the reply on the second charge, relating to the treatment of the Oudh Begums, when Law again *took their Lordships through the history of Hindustan* from the establishment of Mahommedanism in that country to show that the widows of Shuja-u-Dowlah had no right to detain the treasures claimed by his successor. In this manner an astounding mass of *abstruse erudition*, historical precedent. judicial texts, and oral testimony, drawn indiscriminately from Europe and Asia, was heaped and piled up over every point, until *the real issue and its true aspect lay lost, hid and*

shrivelled like a mummy under a huge pyramid. The dreary and flat waste of the voluminous record is studded here and thereby these monuments of useless labour set up over against each other by the indefatigable energy of the disputants.

Lord Thurlow in trying to upset Pitt had himself been upset, and *had lost the seats*; Lord Loughborough presided in his stead. The defending counsel toiled on in the task of picking to pieces the network of accusations in dissecting propositions and arguments. *exposing different sides of the same shield*, setting one account of an affair against another flatly opposed to it, proving that saints were sinners and sinners saints, *pouring cold water on the embers of the smouldering invectives of Burke and Sheridan* until the vast collection of contradictory proof and arguments must have become intellectually unintelligible.

2. Give an account of the suppression of the Rohillas, *or* of the relations between Francis and Hastings.

3. Analyse the following sentence, paying particular attention to the relationships of the clauses : —

The story tells how he let himself down the city walls one cloudy night, and wandered about the fields in the dark till he found a peasant watching crops who showed him a ford of the Jumna and whom he resolved, after this service, to kill "lest he should inform the enemy of my route"; how he spared the man at the last moment on

all the world is talking against him, or because he belongs to some sect or party that everybody despises.

(c) The knowledge of limits is the first postulate of wisdom, and it is better to practise walking steadily on the solid earth to which we belong, than to usurp the function of birds, like Icarus, and achieve a sorry immortality by baptizing the deep sea with our name.

2. Discuss the importance of Physical exercise and fresh air to the student ; *or*, expand and illustrate the thought, "The real dignity of a man lies not in what he *has* but in what he *is*."

3. Parse the italicised words in the following sentences :—

All the natural sciences are particularly valuable, not only *as supplying* the mind with the most rich, various, and beautiful furniture, but as teaching people that most useful of all arts, *how to use* their eyes.

We *are* now *come* to the most important of the three great chapters of self-culture.

Should it be necessary to say a word about sleep?

One *would think* not.

Section C.

1. Explain the portions in italics in the following passages :—

(a) Alva was of course violently angry. He arrested every English ship in the *Low Countries*. He arrested every Englishman he could catch

The English ships had the same superiority over the galleons which steamers have now over sailing vessels.   They had twice the speed; *they could lie two points* nearer *to the wind.* Sweeping round them at cable's length, crowding them in one upon another, yet never once giving them a chance to grapple, they hurled their *cataracts of round shot.*

2.   How does Froude justify Drake's piratical expeditions? *Or*, to what causes does he attribute the defeat of the Spanish Armada ?

3.   Parse the italicised words in the following sentences :—

Sooner than *see* England absorbed in the Spanish monarchy he forgot his bigotry in his politics.

He must put out his strength in earnest, or his own Spaniards *might turn* upon him *as* unworthy of the crown of Isabella.

I am not *the* least surprised if English seamen *were* intolerant. I *should be* very much surprised if thay *had* not *been.*

SECOND PAPER
Poetry

(The answers to Section A to be written in book marked I, those to Section B in book marked II).

Section A

1. Explain with reference to the context the meaning of any four of the following passages :—

The English ships had the same superiority over the galleons which steamers have now over sailing vessels. They had twice the speed; *they could lie two points* nearer *to the wind.* Sweeping round them at cable's length, crowding them in one upon another, yet never once giving them a chance to grapple, they hurled their *ca'aracts of round shot.*

2. How does Froude justify Drake's piratical expeditions? *Or,* to what causes does he attribute the defeat of the Spanish Armada ?

3. Parse the italicised words in the following sentences :—

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I am not *the* least surprised if English seamen *were* intolerant. I *should be* very much surprised if thay *had* not *been.*

SECOND PAPER
Poetry

(The answers to Section A to be written in book marked I, those to Section B in book marked II).

Section A

1. Explain with reference to the context the meaning of any four of the following passages :—

(a) As with his wings aslant
   Sails the fierce cormorant,
   Seeking some rocky haunt,
      With his prey laden ;
  So towards the open main,
  Beating to sea again,
  Through the wild hurricane
    Bore I the maiden.

(b) The chief's eye flashed ; but presently
  Softened itself, as sheathes
  A film the mother eagle's eyes
  When her bruised eagle breathe ;

(c) Long may the spring
  Quietly as a sleeping infant's breath
  Send up cold waters to the traveller.
  With soft and even pulse.

(d) If hopes were dupes, fears may be liars;
  It may be in yon smoke concealed,
  Your comrades chase e'en now the fliers
    And, but for you, possess the field.

(e) Others he saved, himself he could not
    save.
  Nay, the lost life was saved. He is
    not dead
  Who in his record still the earth shall
    tread
  With God's clear aureole shining round
    his head.

(f) I therefore purpose not, or dream
  Descanting on his fate,

> To give the meláncholy theme
> A more enduring date;
> But misery still delights to trace
> Its semblance in another's case.

2. Explain in simple English the meaning of
    the   following   passage,   stanza by
    stanza :—

The glories of our blood and state
        Are shadows not substantial things,
There is no armour against Fate
        Death lays his icy hand on kings :
            Sceptre and crown
            Must tumble down,
And in the dust be equal made
With the poor crooked scythe and spade.

Some men with swords may reap the field,
        And plant fresh laurels they kill ;
But their strong nerves at last must yield
        They tame but one another still :
            Early or late
            They stoop to Fate,
    And must give up their murmuring breath
When they, pale captives, creep to death.

The garlands wither on your brow.
    Then boast no more your mighty deeds ;
Upon Death's purpose alter now
    See where the victor-victim bleeds.
        Your heads must come
        To the cold tomb;

Only the actions of the just
Smell sweet, and blossoms in their dust.

3   Explain clearly the meaning of the italicised
portions only of any three of the following pass-
ages :—

> (a) A countenance in which did *meet*
>   Sweet *records, promises as sweet ;*
>   A creature not *too bright or good*
>   *For human nature's daily food.*

> (b) Thou sing'st as if the *god of wine*
>   *Had help'd these to a Valentine ;*
>   A song in mockery and *despite*
>   Of shades, and dews, and silent night,
>   And *steady bliss.*

> (c) *The hues of bliss more brightly glow*
>   *Chastised by sabler tints of woe,*
>   *And blended from with artful strife*
>   *The strength and harmony of life.*

> (d) *Whom nothing can procure*
>   *When the wide world runs bias, from his*
>   *will*
>
>   *To writhe his limbs, and shore, not*
>   *mend, the ill.*

Section B

4   It is *high* time that some *stand were
made* to oppose the many *agencies* by which the
beauty of English scenery is *threatened*. If we
were sure that the *disfiguring of our countryside*
was *the only alternative* to a great increase of
poverty then we might consent to *it*, since the

poverty would lessen the *joy of life* even *more-than the disfigurement.* But we are not sure of *anything of the kind.* The fact that the poor seldom protest against it does not prove that they do not suffer from it. They have in the past sometimes lost even rights of great *material value* without any protest; and there is no material value, so far as they can see, in the vanishing beauty of the countryside; nothing to make food cheaper or the hours of work shorter.

Explain clearly the meaning of the italicised portions of the above.

Analyse the sentence beginning 'if we were sure' and ending 'than the disfigurement.'

5.   Plain speaking is a cause of trouble, if the result of it is resentment which is poison to friendships; but compliance is really the cause of *much more* trouble, because by indulging his faults. it lets a friend *plunge* into headlong ruin. But the man who is most *to blame* is he who resents plain speaking and allows flattery to egg him on to his ruin. On this point, then, from first to last there is need of deliberation and care. If we remonstrate *it* should be without bitterness; if we reprove, there should be no word *of* insult. In the matter of compliance, though there should be every courtesy, yet that base kind which assists a man in vice should be far from us, for *it* is unworthy of a free-born man, *to say nothing* of a friend. It is. one thing to live with a tyrant, *another* with a friend.

In the above passage, what is meant by "plain speaking"?

How is "resentment" a "poison to friendship"?

Give illustrations of the vicious kind of compliance to which the author refers.

Parse the words italicised.

THIRD PAPER

Subject for an Essay

"The education of after-life is necessarily the education which each one gives himself..... Self-education consists in a thousand things, commonplace in themselves."

HINDI

(Sections I and II to be written in separate books).

Section I

Translate into English :—

टोमियस चादशाह का मंत्री (सलाहकार) था। वह बहुत सी बातों में प्रसिद्ध था विशेष करके इस कारण से कि वह ऐसा चतुर था कि यदि कोई विपत्ति उस पर एकाएक हमला करती तो वह कुछ न कुछ अपने बचने का उपाय कर ही सकता था। एक बार वह अपने मकान के छत पर बैठा हुआ था जहाँ वह शाम के वक्त ठंडी हवा खाने को जाया करता था कि इतने में एक पागल आदमी छिपकर उसके मकान में घुस आया और उसके तरफ दौड़ा और ज़ोर से चिल्ला कर उसको हुक्म दिया कि अभी नीचे कूद पड़। टोमियस यद्यपि जानता था कि वह आदमी पागल है क्योंकि उसने उस पागल को उस वैद्य के घर पर अक्सर देखा था जो उसका इलाज करता था पर इतना बूढ़ा था कि

खुद अपने बल से उसे हटाने को सामर्थ न था । उसने देखा कि बचने का जोग तो केवल किसी छल से उस पागल को धोखा देने से ही है । सो वह छत पर से नीचे कूदने को राज़ी हो गया । पर उसने कहा कि यदि पहिले उस बिल्ली को जो पास बैठी थी नीचे गिरावें तो कैसे कूदे बेहतर मालूम हो जावे । इस सूचना से पागल बहुत खुश हो गया और उसने बिल्ली को पकड़ कर नीचे गिरा दिया । बिल्लियां तो बहुत दूर से गिर कर भी चोट नहीं खातीं । वह बिल्ली भी ज़मीन पर पहुंचते ही कूद कर भाग गई । तब टोमियस ने कहा नीचे चलो और उस बिल्ली को पकड़ो कि उसे फिर गिरावें ताकि अब की बार वह बच जाने न पावे ज्योंही वह पागल बिल्ली के लिये छत से उतरा कि टोमियस ने बड़ी चाह से अवसर पा कर दरवाज़ा बन्द कर दिया और उस पागल का भीतर आना रोक दिया ।

———

URDU

(Sections I and II to be written in separate books).

Section I

Translate into English :—

ٹرومِیس بادشاہ کا صلاح کار تھا ۔ یہ شخص بہت باتوں میں مشہور تھا ۔ بالتخصوص اس وجہ سے کہ وہ اتنا چالاک تھا کہ اگر کوئی حملہ اور خطرہ یکایک پیش آوے تو یہ ہمیشہ کوئی نہ کوئی بندوبست اپنے بچنے کا کرہی سکتا تھا ۔ ایک بار وہ اپنے مکان کی چھت پر بیٹھا ہوا تھا ۔ جہاں کہ وہ شام کے وقت ٹھنڈی ہوا کھانے کو جایا کرتا تھا کہ اتنے میں ایک پاگل آدمی چھپ کر اسکے مکان میں گھسکر اسکی طرف دوڑا اور زور سے چلاکر حکم دیا کہ ابھی نیچے کود پڑ ۔ ہر چند کہ یہ جانتا تھا کہ وہ ایک دیوانہ آدمی ہے ۔ کیونکہ اسکو اکثر اس حکیم

کے مکان پر دیکھا تھا جو اُس کاعلاج کرتا تیا ۔ لیکن یہ خرد اتنا برزہ؟
تھا کہ اپنے زور سے اُسے ہٹا نہیں سکتا تھا ۔ اُسنے دیکھا کہ بچنے کی
تدبیر تو صرف کسی قریب سے اُس پائل کو دھوکا دینے ہی میں ہے ۔ سو وہ
اپنے کوٹھے کی چھت سے نیچے کودنے پر راضی ہوگیا ۔ پر اُس نے کہا اگر
پہلے اُس بلی کو جو پاس بیٹھی تھی نیچے گراویں تو کیسے کودیں بہتر
معلوم ہوجارے ۔ اس صلاح سے وہ پائل بہت ہی خوش ہوا اور اُس
بلی کو پکڑ کر نیچے گرا دیا ۔ لیکن بلیاں بہت بلندی سے گر کر زخمی
نہیں ہوتیں ۔ وہ بلی بھی بھی زمین تک پہنچتے ہی کود کر بھاگ گئی ۔
تب تومیس نے کہا کہ نیچے چلو اور اُسکو پکڑو نہ ہم لوگ اُسے پھر
گراویں تاکہ اب کی بار وہ کسی قہب سے بچ نہ سکے ۔ اور جیوں ہی
وہ پائل بلی کے پکڑنے کے لئے چیت سے اُترا کہ تومیس نے بڑی
چالا سے موقع پاکر دروازہ بند کردیا اور اُسکا اندر آنا روک دیا ٭

Section II

ENGLISH COMPOSITION

You are to write one and only one of the following :—

either

(A) Reproduce briefly the plot or story of any book that may have interested you recently,

or

(B) In the form of a letter to a friend describe any place or places that you may recently have visited.

Intermediate Examination Papers, 1910

ENGLISH
First Paper
Section I

1. Give the substance of any *two* of the following passages in your own words:—

(a) So far from rushing hastily into merely professional studies, young man should rather be anxious to avoid the engrossing influence of what is popularly called 'shop'. He will soon enough learn to know the cramping influence of purely professional occupation

(b) Let a man learn as early as possible honestly to confess his ignorance and he will be a gainer by it in the long run; otherwise the trick by which he veils his ignorance may become a habit by which he conceals it from himself, and learns to spend his whole life in an element of delusive show to which no reality corresponds.

(c) Conceit, which is natural to youth, is sure to be pruned down; the whole of society is in a state of habitual conspiracy to lop the overweening self-estimate of any of its members; but a little decent cowardice is always safe; and those who begin life by being afraid to speak what they think are likely to end it by being afraid to think what they wish.

2. Explain the figurative expressions in italics in the following sentences :—

(a) Reading, in the case of more miscellaneous readers, *is like the racing of some little dog about the moors, snuffing everything and catching nothing.*

(b) Beware, therefore, of *being infected with the moral contagion* which more or less *taints the atmosphere* of every rich trading and manufacturing community,— the contagion *which breeds a habit* of estimating the value of men by the external apparatus of life rather than by its internal nobility.

(c) In commercial transactions it is found a great safeguard against debt, to pay for everything as much as possible, in cash, and, where that is not possible, not to run long accounts but to strike clear balances at certain set seasons. *Exactly so in our accounts with God and with our souls.*

3. Discuss briefly either :—

(a) The original and proper sources of knowledge are not books ;

or

(b) Virtue or wise action lies in the mean between the two extremes of too little and too much.

Section II

4. England's position in 1773 might be likened to that of some one who should have unexpectedly inherited vast estates in remote countries far apart from each other, and should have discovered that

their title was bad, their management worse, that
on his western estate he was being involved in very
costly and unpleasant litigation with occupants
who *claimed to sit rent free*, and on his eastern
property in all the troubles caused to *absentee
proprietors* by dishonest and incapable agency.

(*a*) Explain the above by stating the historical
facts corresponding to the figurative statements.

(*b*) Give the full meaning of the expression in
italics.

(*c*) Name the antecedent to each pronoun, and
parse *should have inherited*.

5.   Explain in connexion with the context any
four of the following passages : —

(*a*) In those days Indian commerce not only
followed but carried the flag ; and conquest was
still treated as a subordinate and incidental contin-
gency.

(*b*) Hastings was soon reduced to the predica-
ment of a financier who has embarked upon some
daring and extensive operations, who finds that his
distant agents are mismanaging the business and
squandering the capital, and who must yet either
meet their bills or accept bankruptcy.

(*c*) Governors and high officials of that period
had to be as ready with the pistol as with the pen
for a challenge was often the resource not only of
irritated rivals but of disappointed subordinates.

(*d*) The half-effaced slabs that may still be
found below the glacis of the crumbling forts or in

accusations; and that at the rate of progress hither-
to made he had no human expectation of living to
make his defence, or to hear Lordships' judgment.

SECOND PAPER

1. Give in your own words the meaning of
the following poem, stanza by stanza :—

> Does the road wind uphill all the way?
>   Yes to the very end.
> Will the day's journey take the whole long
>   day?
>   From morn to night, my friend.

> But is there for the night a resting place?
>   A roof for when the slow dark hours begin
> May not the darkness hide it from my face?
>   You cannot miss that inn.

> Shall I meet other wayfarers at night?
>   Those who have gone before.
> Then must I knock, or call when just in sight?
>   They will not keep you standing at the door.

> Shall I find comfort, travel-sore and weak?
>   Of labour you shall find the sum.
> Will there be beds for me and all who seek?
>   Yea, beds for all who come.

2. Give in your own words the general out-
line of any poem, except that in Question 1, in
the prescribed selections, which especially ap-
peals to you. What are the qualities you parti-
cularly admire in it? Quote any eight consecu-
tive lines from it.

N. B.—Lines selected for quotation must not include any appearing in Question 3.

3. Explain clearly the meaning of any *five* of the following passages and give the general substance of the poems from which they come :—

(*a*) We look before and after,
    And pine for what is not ;
  Our sincerest laughter
    With some pain is fraught ;
  Our sweetest songs are those that tell of
    saddest thought.

(*b*) He cut it short, did the great god Pan.
    (How tall it stood in the river) ;
  Then drew the pith like the heart of a
    man
    Steadily from the outside ring,
  And notched the poor dry empty thing
    In holes as he sat by the river.

(*c*) His teachers were the true heart's wail,
    The tyrant and the slave,
  The street, the factory, the jail,
    The palace and the grave.

(*d*) Like mighty winds before them ever
    Those mighty voices rolled ;
  Swept from their track, huge bars run back
    And giant gates unfold.

(*e*) Who hath his life from rumour freed ;
    Whose conscience is his strong retreat ;
  Whose state can neither flatters feed,
    Nor ruin make oppressors great.

(f) Nor, cruel *as it* seem'd could he
    Their haste *himself* condemn,
Aware that flight, in such a sea
    Alone could rescue them ;
Yet bitter felt it still to *die*
    Deserted, and *his friends* so nigh.

PART II

4. Analyse passage (f) in Question 3 and parse the italicised words.

5. Explain the expressions in italics in the following passage :—

If our farming does not improve, *it will not be for lack of 'patent remedies.'* They are so plentiful that it is no easy task to get the person most concerned to take an interest in some of them. That he is particularly sceptical as to the value of 'patent remedies' set forth in books is notorious. The impartial observer who knows something of agriculture understands the causes of his distrust. An amazing amount of rubbish is written on rural matters every year. *Even with the best will*, it is difficult for a man unaccustomed to buying and choosing cooks *to tell the grain from the chaff.* Then, like other people who are not habituated to reading, the farmer *has ordinarily quite an exaggerated impression of the financial returns* which authors are able to obtain. He thinks that the man who writes a book for farmers *stands to make very easily a great deal of money at their expense.* He regards an author, therefore, with very much the

(c) You need not imagine you will never need help.
(d) The garden has been allowed to run wild.
(e) The dark years of famine wore slowly to their close.
(f) This can be stood no longer.
(g) Has it to be done and am I to do it ?
(h) Being unequal to the strain put upon it, the rope gave.

THIRD PAPER

(*For candidates whose mother-tongue is English.*)

Subject for Essay :—

True Politeness.

HINDI
Section I

एक समय कोई आदमी पहाड़ी देशों में भ्रमण करते हुए ऐसे एक स्थान पर गया कि जहां एक चट्टी शिला गिरने से मार्ग बन्द हो गया था। उस पत्थर के ऊपर से या इधर उधर से जाना असंभव था। पहिले तो उसने उस शिला को लुढ़काने का प्रयत्न किया परन्तु यह उसके शक्ति के बाहर था। वह ऐसे निर्जन और एकान्त स्थान में रात बिताने में निरास होकर बैठ गया। कुछ समय के अन्तर एक पथिक पहुंचा उसने उस शिला को हटाने का प्रयत्न किया और निष्फल होकर प्रतीज्ञा में बैठ गया कि आगे चढ़ने का योग कब आता है। ऐसे और पथिक भी आए। प्रत्येक ने उस शिला को मार्ग से हटाने का प्रयत्न किया परन्तु वह शिला इतनी भारी थी कि उसको कोई भी हटा न सका। और क्रमशः हार कर नैराश्य में बैठे। अन्त में उनमें से एक उठ खड़ा हुआ और कहने लगा कि मित्रो अकेले २ इस शिला को हम नहीं

उठा सकते पर आश्रो देखें हम एकत्र हो।कर हिला सकते हैं या नहीं ७
श्रौरों ने प्रसन्नता से इसको मान लिया वन सब की चेष्टा से वह खिल॰
इटो । और ये अपने सफ़र में आगे बढ़ने पाये ।

इसी प्रकार इस संसार की कठिनता प्राय: ऐसी दुर्गम होती है कि
श्रौरों की सहायता और मित्रता सिवाय सह्य नहीं हो सकतीं परन्तु
पस्पर सहायता से बहुत कुछ सुलभ हो जाती हैं ।

URDU
Section I

ایک دفعہ ایک شخص پہاڑی ملک میں سفر کرتے ہوئے ایسی جگہ
پہونچا جہاں ایک بہت بڑے پتھر کے گرنے سے راستہ بند ہوگیا تھا ۔
اس پتھر کے اوپر یا اسکے ادھر سے جانا ممکن نہ تھا ۔ پہلے تو
اسنے اس پتھر کو لڑکانے کی لڑکانے کی کوشش کی مگر یہ اسکی طاقت سے باہر تھا ۔
وہ ایسی سنسان اور ویران جگہ میں رات کاٹنے کے خیال سے مایوس
ہوکر بیٹھنے گیا ۔ تھوڑی دیر بعد ایک اور مسافر اُن پہونچا ۔ اسنے بھی
پتھر ہٹانے کی کوشش کی اور ناکامیاب ہوکر اس انتظار میں بیٹھے گیا
کہ آگے بڑتنے کا موقع کب ملتا ہے ۔ ایسے ہی اور مسافر بھی آئے ۔ ہر ایک
نے اس پتھر کو راستے سے ہٹانے کی کوشش کی لیکن وہ اتنا بھاری تھا کہ
کوئی بھی ہٹا نہ سکا اور سب باری باری ہار کر نا امیدی سے بیٹھے گئے ۔
آخر کار اُن میں سے ایک اُٹھہ تھوڑا ہوا اور کہنے لگا کہ دوستو ہم اکیلے
اکیلے اس پتھر کو نہیں اُٹھا سکتے پر آو دیکھیں ہم ملکر اُسکو ہلا سکتے
ہیں کہ نہیں ۔ اوروں نے خوشی سے اس کو مان لیا ۔ اُن سب کی
کوشش سے پتھر ہٹ گیا اور وہ سفر میں آگے بڑتنے پائے ۔ اسی طرح سے
اس زندگی کی مشکلات ایسی سخت ہوتی ہیں کہ اوروں کی دوستی
اور مدد کے بغیر اُنکی برداشت نہیں ہوسکتی لیکن باہمی امداد سے بہت
کچھہ آسانی ہوجاتی ہے *

Section II
COMPOSITION

Choose the life of any great man or great
woman for a brief narrative. Confine yourself to
the main events of the life; and do not extend your
writing beyond eight pages of the answer-book.

Intermediate Examination Papers 1911

ENGLISH

FIRST PAPER

[*Answers to sections I and II should be written in separate books.*]

Section I

1. Give the substance of any *two* of the ollowing passages in your own words, and explain fully the italicised words and phrases:—

(*a*) The knowledge of limits is the first *postulate* of wisdom, and it is better to practise walking steadily on the solid earth to which we belong than to usurp the junction of birds, like *Icarus*, and achieve a sorry immortality by baptizing the deep sea with our name.

(*b*) In the matter of sleep students are great sinners ; nay, this very profession is a sin against repose : and the strictest *prophylactic* measures are necessary to prevent certain *poaching practices* of thinking men into the sacred domain of sleep.

(*c*) Let us therefore turn youthful imaginations into great picture galleries and *Walhallas* of the *heroic* souls of all times and all places ; and we shall be incited to follow after good, and be ashamed to commit any sort of baseness in the direct view of such ‘ *a cloud of witnesses* ’.

2. State briefly what you learn from Blackie about Novel-reading, Obedience, Exercise. --

3. Give a brief account of any *two* of the following

(*a*) Goldsmith's *Man in Black*, (*b*) Addison's *Sir Roger in Westminster Abbey*, (*c*) Washington Irving's *Christmas Eve*.

4. Parse the italicized words in the following sentence :—

Supposing, however, that the supply of good nourishment is adequate. *people* are apt to *err* in various ways when they come *to use it*.

5. Give the context of any *two* of the following passage. and explain the difficulties :—

(*a*) When this happened, their furniture was distrained without mercy ; for the tax was farmed ; and a farmer of .taxes is, of all creditors proverbially the most rapacious.

(*b*) But to a landsman these tarpaulins, as they were called seemed a strange and half-savage race. All their knowledge was professional; and their professional knowledge was practical rather than scientific. Off their own element they were as simple as children. Their department was uncouth.

(*c*) In allusion to their spurious groats, some Tory wit had fixed on demagogues, who hypocritically affected zeal against Popery, the nickname of Birminghams.

6. What does Macaulay say about. *either* travelling *or* the state of Literature in England in 1685?

7. With reference to the context give in your own words the substance of the following passages :—

(*a*) This manner of life grew so. exquisitely pleasant that he never had a moment heavy upon his hands ; his nights were untroubled and his days joyous, from the practice of temperance and exercise. It was his manner to use stated hours and places for exercises of devotion, which he performed aloud, in order to keep up the faculties of speech, and to utter himself with greater energy. When I first saw him, I thought, If I had not been let into his character and story, I could have discerned that he had been much separated from company, from his aspect and gestures.

(*b*) ' I was born ' (says he) ' on the side of a mountain, near a little village of Peru, and made a voyage to England in an ingot, under the convoy of Sir Francis Drake. I was, soon after my arrival, taken out of my Indian habit, refined, naturalized and put into the British mode. with the face of Queen Elizabeth on one side, and the arms of the country on the other. Being thus equipped, I found in me a wonderful inclination to ramble, and visit all parts. of the new world into which I was brought.'

(c) I must own I have such an indifferent-
opinion of the vulgar that I am ever led to sus-
pect that merit which raises their shout ; at least
am certain to find those great and sometimes
good men, who find satisfaction in such acclam-
ations, made worse ; and history has too fre-
quently taught me that the head which has grown
this day giddy with the roar of the million has
the very next been fixed upon a pole.

8.   Analyse :—

In these anecdotes there is, doubtless, a large
mixture of fable ; but they are not on that
account unworthy of being recorded ; for it is
both an authentic and an important fact that
such tales whether false or true, were heard by
our ancestors with eagerness and faith.

SECOND PAPER
*[Answer to sections I and II should be written in
separate books.]*
Section I

1.   Explain clearly the meaning of any *five* of
the following passages, and name the author in
each case :

(a) *Lambs*, that through the mountains went
Frisking, bleating *merriment*,
When the year was in its prime,
They are sober'd by this time.

(b) To her fair works did Nature link
The human soul that through me ran ;

And much it grieved my heart *to think*
What Man has made of Man.

(c) Whom nothing can procure.
   When the wide world runs *bias*, from his
         will.
   To writhe his limbs ; and share, not mend,
      the ill.
      This is the mark-man, safe and sure,
   Who still is right, and prays to be so still.

(d) Next, upon gloomy phantom chargers,
      The self-devoted came.
   Who rushed *to die*, without reply,
   For duty, not for fame.

(e) *Still*, where rosy pleasure leads,
      See a kindred grief pursue ;
   Behind the steps that misery treads
      Approaching comfort view :
   The hues of bliss more brightly glow
   Chastised by sabler tints of woe.
   And blended form, with artful strife.
   The strength and harmony of life.

(f) Soon as the evening shades prevail,
   The moon takes up the wondrous tale
   And, nightly to the listening earth,
   Repeats the story of her birth ;
   While all the stars that round her burn,
   And all the plants in their turn,
   Confirm the tidings as they roll,
   And spread the truth from pole to pole.

2. Give in your own words the substance of the undermentioned poems :—

(a) The Tide River.

(b) Death the Leveller.

3. Analyse extract (f) in Question I, and parse all the italicised words in that question.

Section II

4. Explain the italicized portions of the following passage :—

Bacon knew quite well the moral dangers that beset *the public man.* But *he had laid himself out to get on in the world,* and success then was hard to attain without servility, adulation, and complacency. The very advantages which he possessed of tact and address were an additional danger to him. Left a poor man by his father's death, he found himself forced at the beginning of his career to become *a suitor to those in power.* At first *he wanted a place* chiefly with a view to securing leisure and means for carrying out his scientific work. During the reign of Elizabeth all his applications for office were unsuccessful *Hope deferred made his heart grow sick.* Time was passing, and with it the chances of accomplishing that reform of learning which was *the dominant interest of his life.* He was conscious too of great abilites, which *might be turned to the advantage of the State.* In the House of Commons he found his talents recognized, and his judgment respected.

The traditions of his family made him *look naturally to a public career*. Life and its porblems, the world and its honours, *the court and its pageantry* had a real attraction for him. Yet he remained *outside the charmed circle of office*.

(*a*) State briefly, in your own words, what consideration attracted Bacon towards a public career, and indicate its dangers.

(*b*) Illustrate what you understand by ' tact and address'.

5. Explain the meaning of *five* of the following phrases, and in the case of each of the five selected construct a short sentence designed to bring out the precise meaning :—

(*a*) To set one's heart on.

(*b*) To beat about the bush.

(*c*) To make a cat's-paw of.

(*d*) As good as a play.

(*e*) To take it ill.

(*f*) To stand upon one's dignity.

(*g*) To make both ends meet.

THIRD PAPER

(For candidates whose mother-tongue is English.)

Write an Essay on the subject of Talk and Conversation. You may utilize the suggestions contained in the following sentences :—

'There can be no fair ambition than to excel in talk, to be affable, gay, ready, clear and

welcome; to have a fact, a thought, an illustra-
tion, put to every subject '.

HINDI

THIRD PAPER

*[Answers to sections I and II should be written
in separate books.]*

Section I

जबको ब्राज़िर में मेरा घोड़ा ठहर गया और मैं अच्छी तरह से
ज़ीन पर चढ़ बैठा तब मैंने अपने पास बहुत अजीब और कुरूप छोटा
आदमी देखा । वह विलकुल पीले वर्ण का था और उसकी नाक कम
से कम एक फुट लंबी थी उसने रुपया मांगा और कहा कि मैंने
आपका भागा हुआ घोड़ा रोका है यह तो झूठ था लेकिन मैंने
उससे आपका पीछा छुड़ाने के लिये उसे एक मोहर देकर घोड़े को
दुलकी चलाया । वह मेरे पीछे दौड़ा और चिल्लाया कि खोटा
सिक्का । जहां तक हो सका मैंने घोड़े को सरपट दौड़ाया । लेकिन
वह बराबर मेरे साथ ही साथ रहा । फिर मैंने घोड़े को रोका और
उसे एक और मोहर देने को तैयार हुआ पर उसने लेने से इनकार
किया तब उसने मुझे ज़मीन के भीतर रहने वाले पिशाचों को दिखाया
तो किस तरह वे सोने चांदी से खेल रहे थे फिर उसने मेरी दी हुई
मोहर उनको दिखाई । तो फिर वे हंसते और पुकारते हुये और अपनी
मैली कुचैली अंगुलियां बढ़ाते हुये मेरी तरफ चढ़ने लगे तब मैं भय
खा गया और पागल की नाईं दुबारा अरण्य में भाग गया । .

THIRD PAPER

URDU

*[Answers to sections I and II to be written in
separate books.]*

Section I

آخر کار جب میرا گھوڑا ٹھہر گیا اور میں اچھی طرح سے زین پر
بیٹھ گیا تو میں نے اپنے پاس نہایت عجیب و بدصورت اور پست قد
آدمی دیکھا ۔ وہ بالکل پیلے رنگ کا تھا اور اُس کی ناک کم سے کم
ایک فٹ لمبی تھی ۔ اُس نے مجھ سے روپیہ مانگا اور کہا کہ میں نے
آپ کا بھاگا ہوا گھوڑا روکا ہے ۔ یہ تو جھوٹ تھا لیکن میں نے اُس
سے پیچھا چھوڑانے کے لئے اُسے ایک مُہر دیکر گھوڑے کو دلکی چلایا ۔ وہ
میرے پیچھے دوڑا اور چلا کر کہا گھوڑا سکہ جہاں تک ہوسکا میں نے
گھوڑے کو سرپٹ دوڑایا لیکن وہ برابر میرے ساتھ ہی ساتھ رہا ۔ پھر
میں نے گھوڑے کو روک لیا اور اُسے ایک اور مُہر دینے کو تیار ہوا پر
اُس نے لینے سے انکار کیا ۔ تب اُس نے مجھے زمین کے نیچے رہنے والے
دیو دکھائے کہ وہ کسطرح سونے چاندی سے کھیلا رہے تھے ۔

Section II

COMPOSITION

Write a letter to a friend who is still at school ;
describe (*a*) your college with its surroundings,
and (*b*) the general life within college, and how
it differs from the life in your old school.

[Your letter must not fill up more than eight
pages of an answer book]

Intermediate Examination Papers, 1912

ENGLISH

First Paper

[*Answers to* Section I *and* II *should be written in separate books.*]

Section I

1. Briefly reproduce the substance of *any two* of the following :—

   (a) Bacon 'On Travel.'

   (b) Goldsmith on the instability of worldly grandeur.

   (c) Helps on the education of a man of business.

2. " The enemies of the liberties and religion of England looked with aversion on a force which could not, without extreme risk, be employed against those liberties and that religion, and missed no opportunity of throwing ridicule on the rustic soldiery. ·

   Explain (a) the meaning of the passage, and (b) the origin of the militia and the causes of its unpopularity with certain classes.

3. Parse the words followed by an asterisk in Section II, Question 4.

Section II

4 Explain, with reference to the context, *any two* of the following :—

   (a) As if the natural calamities of life were not

sufficient for it, we turn the most indifferent cir-
cumstances into misfortunes, and suffer as* much*
from trifling accidents as* from real evils.

(b) And 'people grow selfish about seats near
it; and little boys think their elders tyrannical*
for saying,* ' Oh, you don't want the fire; your
blood is young.' And truly that is not the way of
stating the case, albeit young blood is warmer
than old.

(c) They remained for a moment playing* on
their lips with their fingers, and now and then
stealing a shy glance, from under their eyebrows,
until, as if by one impulse they scampered away,
and as they turned an angle in the gallery,
I heard them laughing in triumph at their escape.

(b) To grieve was not always in his nature; or
when he had his sorrow, to bring all the world on
to condole* with him and bemoan it. Deep* and
quiet he lays the love of his heart, and buries it,
and grass and flowers grow over the scarred
ground in due time.

5. Give, as briefly as you can, in your own
words, the meaning of *any two* of the following
passages :—

(a) Still more important is the benefit which
all orders of society, and especially the lower
orders, have derived from the mollifying influence
of civilization on the national character. The
groundwork of the character has indeed been the
same through many generations, in the sense in

which the groundwork of the character of an in-
dividual may be said to be the same when is a
rude and thoughtless schoolboy and when he is
a fine and accomplished man. It is pleasing to
reflect that the public mind of England has softened
while it has ripened, and that we have, in the
course of ages, become, not only a wiser, but also
a kinder people.

(*b*) But of all the errors in judging others,
some of the worst are made in judging of those
who are nearest to us. They think that we have
entirely made up our minds about them, and are
apt to show us that sort of behaviour only which
they know we expect. Perhaps, too, they fear
us, or they are convinced that we do not and can-
not sympathize with them. And so we move
about in a mist, and talk of phantoms as if they
were living men, and thinking that we under-
stand those who never interchange any discourse
with us but the talk of the marketplace ; or, if
they do, it is only as players who are playing a
part set down in certain words to be eked out
with the stage gestures for each affection, who
would deem themselves little else than mad if
they were to say out to us anything of their own.

(*c*) But perhaps there are no interviews less to
be sought after than those in which you have to
appear in connexion with one or two other parties
who have exactly the same interest the matter as
your own, and must be supposed to speak your
sentiments, but with whom you have had little or

no previous communications ; or whose judgment you find that you cannot rely on. In such a case you are continually in danger of being compromised by the indiscretion of any one of your associates. For you do not like to disown one of your own side before the adverse party : or you are afraid of taking all the odium of opposition on yourself. You may perhaps be quite certain that your indiscreet ally would be as anxious as yourself to recall his words if he could perceive their consequences; but these are things which you cannot explain to him in that company.

6. Explain *any two* of the following passages, bringing out as fully as you can the meaning of the metaphors or similies employed :—

(*a*) Many unhappy persons seem to imagine that they are always in an amphitheatre, with the assembled world as spectators : whereas, all the while they are playing to empty benches.

(*b*) Infinite toil would not enable you to sweep away a mist ; but, by ascending a little, you may often look over it altogether. So it is with our moral improvement : we wrestle fiercely with a vicious habit, which would have no hold upon us if we ascended into a higher moral atmosphere.

(*c*) Our passions master us : and we know them to be our enemies. Our prejudices imprison us : and like mad men we take our jailors for a guard-of-honour.

SECOND PAPER

[*Answers to* SECTIONS I *and* II *should be written in separate books.*]

Section I

1. Explain in simple English the meaning of *two* of the following passages:—

(*a*) All evils here contaminate the mind.
That opulence departed leaves behind;
For wealth . was theirs, not far removed the date,
When commerce proudly flourished through the state :
At her command the palace learn'd to rise,
Again the long fall'n column sought the skies ;
The canvas glow'd beyond e'en Nature warm,
The pregnant quarry teem'd with human form.

(*b*) The broken soldier, kindly bade to stay,
Sat by his fire, and talk'd the night away.
Wept o'er his wounds, or, tales of sorrow done,
Shouldered his crutch, and showed how fields were won.
Pleased with his guests, the good man learned to glow,
And quite forgot their vices in their woe ;
Careless their merits or their faults to scan,
His pity gave ere charity began.

    (c)   The man of wealth and pride
      Takes up a space that many poor supplied ;
.   Space for his lake, his park's extended
          bounds,
      Space for his horses, equippge, and hounds :
      The robe that wraps his limbs in silken
          cloth.
      Has robbed the neighbouring fields of half
          their growth:
      His seat, where solitary sports are seen,
      Indignant spurns the .cottage from the
          green :
      Around the world each needful product flies,
      For all the luxuries the world supplies;
      While thus the land, adorned for pleasure
          all,
      In barren splendour feebly waits the fall.

2. 'Such are the charms to barren states assigned.'

    State briefly in your own words what these
    charms are.

3. Explain carefully, with reference to the context, *any four* of the following :—

    (a) Half a tillage stints the smiling plain.
    (b) Every pang that folly pays to pride.
    (c) And even the bare-worn common is denied.
    (d) The swain, mistrust less of his smutted face.
    (e) Luke's iron crown and Damien's of steel.
    (f) My shame in crowds, my solitary pride.

4. Give a clause analysis of the passage marked (c) in Question I.

Section II

5. Explan the italicised portions of the
following passage :—

If I could make a clean sweep of everything
and start afresh, I should, in the first place,
secure that training of the young in reading and
writing, and in the habit of attention and observa-
tion both to that which is told them, and that
which they see, which everbody agrees to.   But
in addition to that, I should make it absolutely
necessary for everybody, for a longer or shorter
period, to learn to draw. Now, you may, say, there
are some people who cannot draw, however much
they may be taught. *I deny that in toto*, because I
never yet met with anybody who could not learn
to write. Writing is a form of drawing; therefore
if you give the same attention and trouble to
drawing as you do to writing, *depend upon it*,
there is nobody who cannot be made to draw,
more or less well. Do not misapprehend me. I
do not say for one moment you would *make an
artistic draughtsman*. Artists are not made:
they grow. You may improve the natural faculty
in that direction; but you cannot make it; but
you can teach simple drawing, and you will find
it an implement of extreme value. *I do not think
its value can be exaggerated*, because it gives
you the means of training the young in attention
and accuracy which are the two things in which
all mankind are more deficient than in any other
mental quality whatever.

(*a*) Explain the statement 'Artists are not made: they grow.'

(*b*) Illustrate how drawing fosters habits of attention and accuracy.

(*c*) Re-write in the indirect form as reported by one of the audience the extract from the above speech, beginning with the words, 'Writing is a form' and ending with the words, 'they grow.'

6. Explain the meaning of *five* of the following phrases, and in the case of each of the five selected, construct a short sentence to bring out the precise meaning :

>   (*a*) To take exception to.
>   (*b*) To be beside oneself.
>   (*c*) To commit oneself
>   (*d*) To get on in life.
>   (*e*) A fair field.
>   '*f*) To play a great part.
>   (*g*) To command a view.

THIRD PAPER

(For candidates whose mother-tongue is English.)

Write an Essay on ' the Importance of Seeming Trifles.' The subject may be treated in a general way, but more particularly with reference to manners and behaviour, in the spirit of the following lines :—

> 'Since trifles make the sum of human things,
> And half our misery from foibles springs,
> Since life's best joys consist in peace and ease,
> And few can save, or serve, but all can please.

Oh ! let the ungentle spirit learn from hence
A small unkindness is a great offence ;
Large bounties to bestow we wish in vain :
But all may shun the guilt of giving pain.

HINDI

THIRD PAPER

[Answer to SECTIONS I *and* II *should be written in separate books.]*

Section I

अरब का घोड़ा उसके समक्ष में घर का साथी गिना जाता है । वह उसके कुटम्ब के साथ एक तम्बू में सोता है । बच्चे उसको गले लगाते और चूमते हैं । तौ भी उनकी किसी प्रकार की हानि नहीं होती है । रात को जब वे सोते हैं यदि उनके बीच में वह घूमे तो भी किसी को क्षति नहीं पहुंचाता । जब उसका स्वामी उसके ऊपर चढ़ता है तो वह अपनी बहुत प्रसन्नता प्रकाशित करता है । और यदि अकस्मात् स्वामी उससे गिर पड़े तो उसी क्षण ठहर कर जब तक उसका स्वामी ऊपर न चढ़ले तब तक स्थिर ही रहता है । यह भी देखा गया है कि वह अपने घायल स्वामी को मुख से उठा कर सुरक्षित स्थान में ले गया । निः सन्देह ये सब उत्तम गुण घोड़े में उत्तम व्यवहार से उत्पन्न हुए हैं । इस विषय में मनुष्य और घोड़ों के लिए एक ही नियम है । यदि मनुष्यों के साथ अनुकूल और कृपा का व्यवहार किया जाय तो उसके स्वाभाविक अच्छे गुण विकसित होंगे । परन्तु यदि इसके विरुद्ध उनके साथ प्रति- कृत या निष्ठुरता का व्यवहार किया जाय तो वे निश्चेष्ट के नाईं होंगे या तो क्रोध दिखावेंगे । हम प्रायः पशुओं से ऐसा व्यवहार करते हैं कि जितना लाभ हम उनकी सेवा से उठा सकते थे कदाचित् हमने कभी नहीं उठाया ।

URDU

[Answers to SECTIONS I and II to be written in separate books].

Section I

اہل عرب کا گھوڑا اُسکے گھر کا ساتھی گنا جاتا ہے ۔ وہ اسکے خاندان کے ساتھ ایک ہی خیمہ میں سوتا ہے ۔ بچے اُسکو گلے لگا تے اور چومتے ہیں لیکن اُنکو کسی طرح کا نقصان نہیں پہونچتا ۔ رات کو جب وہ سوتے ہیں اگر اُنکے درمیان پہرے تو کسی کو چوٹ نہیں لگاتا ۔ جب اُسکا مالک اُس پر سوار ہوتا ہے تو وہ بہت خوشی ظاہر کرتا ہے ۔ اگر مالک اتفاقاً گر پڑے تو فوراً ٹھہر جاتا ہے اور جب تک پور سوار نہ ہو جاوے بالکل نہیں ہلتا ۔۔ یہ بھی دیکھا گیا ہے کہ وہ اپنے زخمی مالک کو منہ سے اُٹھا کر سلامتی کی جگہ لے گیا ۔ بیشک گھوڑے میں یہ خوبیاں نیک سلوک سے پیدا ہوگئی ہیں ۔ اس امر میں انسان اور گھوڑے کے لئے ایک ہی فائدہ ہے اگر انسان سے مناسب اور نیک سلوک ہو تو اُسکی سب سے اچھی ذاتی خوبیاں ظاہر ہونگی لیکن بخلاف اسکے اگر ظالم اور بیرحمی کی جاۓ تو یا تو وہ بے حس ہو جاویگا یا غصہ دکھلاویگا ہم اکثر جانوروں سے ایسا سلوک کرتے ہیں کہ جو فائدہ ہم اُنکی خدمت سے اُٹھا سکتے تھے غالباً ہم نے کبھی نہیں اُٹھایا ٭

Section II
COMPOSITION

Write an Essay, not exceeding *five* pages of the answer-book, on the following subject :—

An evening walk in the neighbourhood of your home, or of any place which you have visited in town or country, describing its natural features, interesting buildings, historical associations, and other noteworthy points.

Intermediate Examination Papers, 1913

ENGLISH

FIRST PAPER

[Answers to SECTIONS I *and* II *must be
written in separate books].*

Section I

1. Give as simply as you can in your own words
the full meaning of *one* of the following passages :—

Either,

(*a*) Is there no harm in never looking further
than the worst motive that can possibly be imag-
ined for the actions of our political adversaries?
Are we to consider the opposite party as so many
Samaritans; and is there nothing that we have
ever heard or read, which should induce us to
abate our Jewish antipathy to these brethren of
ours who do not worship at our temple? This is an
illustration from which political bigots cannot
escape. Even their own pretensions of being
always in the right will only bring the instance
more home to them. The Jews were right about
matter in dispute between them and the Samari-
tans. "Salvation is with the Jews." But this
is never held out to us as any justification of
their behaviour

Or,

(*b*) The ripeness or unripeness of the occasion.
as we said, must ever be well weighed, and

generally it is good to commit the beginnings of all great actions the Argus with his hundred eyes, and the ends to Briareus with his hundred hands, first to watch and then to speed. For the helmet of Pluto, which maketh the politic man go invisible, is *secrecy in the council and celerity* in the execution. For when things are once come to the execution there is no secrecy comparable to celerity, like the motion of a bullet in the air, which flieth so swift as it outruns the eye.

2. Explain any *three* of the following passages with reference to the context, bringing out clearly the meaning of difficult words and phrases :—

(*a*) Not perceiving that time is told by that pendulum, man, which goes backwards and forwards in its progress ; nor dreaming that the way to some opinions may lie through their opposites; they are mightily ashamed of inconsistency, and may be made to look upon reparation as a crime.

(*b*) The oracles will *Philippise*, as long as Philip is the master ; but still they have an inner meaning for Athenian ears.

(*c*) The great estimation, however, in which this knight of the stone bottles is held may turn out a circumstance propitious to the volume of which his history will make a part. These events that prove the prelude to our greatest success are often apparently trivial in themselves, and such as seemed to promise nothing.

(*d*)   Heaven guard my brows from the wreath ·
you mention, whatever wreath beside may here-
after adorn them! It would be a leaden extingui-
sher clapped on all the fire of my genius.

(*e*)   As he paced forth in the ghostly darkness,
carrying his own sun by a ring about his finger,
day and night swung to and fro, and up and down
about his footsteps.

3.   Turn into indirect speech as reported (*a*)
by the speaker, (*b*) by the person addressed, (*c*)
by a third person present. 'I'll give thee nothing :
The guardians of the temple should pay your
wages, friend, and not permit you to sque'eze thus
from every spectator, Show me the grate.'

Section II

4.   Give in your own words the substance of,
either (*a* Cowper's account of parliamentary elec-
tion, including the canvassing ; *or* (*b*) Addison's
opinion of household superstitions.

5.   Explain *any three* of the following sen-
tences, showing that you understand the figures of
speech employed ; (*a*) He was such a sloven, as if
he had trusted to his genius as a cloak for every-
thing that could disgust you in his person.   (*b*)
Though I do not think his absolutely an Æscul-
apius, I believe him to be as skilful as most of his
fraternity in the neighbourhood. (*c*) The mask
soon becomes an instrument of torture. (*d*) Hope,
an architect above rules, can build, in reverse, a
pyramid upon a point. (*e*) Distilled books are

like common distilled waters, flashy things. (*f*)
We may not win the baton or epaulettes ; but
God give us strength to guard the honour of the
flag !

6. (*a*) Analyse the following sentences :—My
reason for proposing an amendment ·of it was,
that your meaning did not strike me, which there-
fore I have endeavoured to make more obvious.

. And *(b)* Parse the words in italics in the
following sentence : If he *read little* he *had* need
have much cunning *to seem* to know *that* he *doth* .
not.

SECOND PAPER.

[*Answer to* SECTION I *and* II *must be writtenin
separate books.*]

Section I

1. Explain clearly and *briefly* the meaning of
two of the following passages :—

(*a*) But small the bliss that sense alone bes-
tows,
And sensual bliss is all the nation knows,
In florid beauty groves and fields appear,
Man seems the only growth that dwindles
here
Contrasted faults through all his manners
reign ;
Though poor, luxurious ; through submis-
sive, vain ;

Though grave, yet trifling ; zealous, yet
  untrue ;
And even in penance planning sins anew.

(b) But past is all his fame. The very spot
Where many a time he triumphed is forgot
Near yonder thorn, lifts its head on high
Where once the sign-post caught the pass-
  ing eye,
Low lies that house where nut-brown
  draughts inspired,
Where grey-beard mirth and smiling toil
  retired,
Where village statesmen talked with looks
  profound,
And news much older than their ale went
  round.

(c) Sweet Auburn ! parent of the blissful hour,
Thy glades forlorn confess the tyrant's
  power.
Here, as I take my solitary rounds
Amidst thy tangling walks and ruined
  grounds.
And, many a year elapsed, return to view
Where once the cottage stood, the haw-
  thorn grew.
Remembrance wakes with all her busy train,
Swells at my breast, and turns the past to
  pain.

2. 'Yet think not, thus when Freedom's ills
  I state,
I mean to flatter kings, or court the great.'

3. Explain in connection .with the context *any three* of the following :—

(*a*) The hollow-sounding bittern guards its nest.

(*b*) The loud laugh that spoke the vacant mind.

(*c*) E'en his failings leaned to virtue's side.

(*d*) Fools, who came to scoff, remained to pray.

(*e*) Luke's iron crown and Damien's bed of steel.

4. Give a clause analysis of :—

They please, are pleased ; they give to get esteem,
Till, seeming blest, they grow to what they seem.

Section II

5. Cæsar, though apparently *fortunate in his early home-life*, in the influence of mother and tutor, must for the most part have had to educate himself. *That he did, so, and intentionally*, we may regard as certain ; but *the details of the process*, which in the biography of a modern statemant would be full of interest, *are entirely hidden from us.* In one sense, however, his education was a life-long task. We can see him steadily growing, in self-restraint. *in humanity,* and in the sense of duty and in the love of work, as well as in political wisdom, *in knowledge of human nature*, and in *the skilful adaptation of means to ends.* Up to the time of his first con-sulship, when he was over forty years of age. *we do not see much in him that places him apart*

4

from the ordinary Roman of his day, unless it be a certain tendency to reserve his strength, an apparent inclination to watch and wait.

   (*a*) Explain the parts italicised in the above passage.

   (*b*) What do you understand by the term Education, when it is described as a 'life-long task' ?

6. Explain the meaning of *any five* of the following phrases, and write short sentences to their use :—

   (*a*) To be quite alive to.
   (*b*) To be advised of.
   (*c*) To hold good.
   (*d*) To be worth one's while.
   (*e*) To be too good.

THIRD PAPER
ENGLISH COMPOSITION

[For Candidates whose mother-tongue is English.]

1. Write an Essay on ' The Value of Reading under the following headings :—

   (*a*) The mind however intelligent needs information.
   (*b*) Making use of other men's work an economy of time.
   (*c*) Danger to originality.
   (*d*) Care necessary in the choice of books.
   (*e*) Information and originality combined.

2. Analyse :—

Breathes there the man with soul so dead,
Who never to himself hath said,
' This is my own, my native land !'
Whose heart hath ne'er within him burn'd
As home his footsteps he hath turn'd
From wandering on a foreign strand ?

3. Explain carefully with illustrations the accurate use of (a) the auxiliary 'do,' (b) the double negative, (c) ' and ' with the relative, (d) 'but that,' (e) ' which ' and ' that.'

4. Criticize the following sentences :—

(a) He hoped that money should have been given him.

(b) I did not speak yesterday as I wished to have done.

(c) One or other are wrong.

(d) Would that man could be removed to another sphere of usefulness.

(e) He rode to the village and on his arrival there turned his horse into a stable.

(f) So I promised to say nothing which I hoped would conciliate them.

URDU

THIRD PAPER.

[Answers to Sections I and II should be written in separate books.

Section I

دسي آدمي کے گھر میں ایک روپیوں کي تھیلي چوري گئي * روپیوں
کے مالک نے اُس شہر کے قاضي کو خبر دي * قاضي نے فوراً اُس گھر کے
تمام آدمیوں کو روبرو طلب کیا * مگر باوجود بہت تحقیقات کے وہ
چور کو دریافت نہ کرسکا * آخر میں اُنہے اُن لوگوں سے کہا '' میں تم
میں سے ہر شخص کو ایک ایک ہاتھ کي لمبي لکڑي دونگا * اور ایسا
واقع ہوگا کہ چور ہوگا اُسکي لکڑي باقي لوگوں کي لکڑیوں سے ایک
اِنچ زیادہ لمبي ہو جاویگي * یہ کہکر قاضي نے ہر شخص کو ایک ایک
لکڑي دي اور رخصت کر دیا ● رات میں چور نے ڈر کر اپنے دل میں
کہا ● اگر میں ایک انچ اپني لکڑي میں سے کاٹ ڈالوں تو صبح کو
میري لکڑي لمبائي میں اور لکڑیوں کے برابر رہیگي ● اِسطرح خیال
کرکے اُس نے اپني لکڑي سے ایک انچ کاٹ ڈالا ● اور صبح کو وہ تمام
لوگوں کے ساتھ حاضر ہوا ● قاضي نے دیکھکر اس طریقہ سے
چور کو دریافت کرلیا ''
●

HINDI

THIRD PAPER

[Answers to SECTIONS I and II should be written in separate books.]

Section I

किसी आदमी के घर में रुपये की एक थैली चोरी हो गई । रुपये
के मालिक ने शहर के न्यायकर्ता को सूचना दी । न्यायकर्ता ने वसी

चण उस माकन के सब आदमियों को अपने सामने बुलाया । पर बहुत
अन्वेषण करने पर भी वह चोर न पकड़ सका । अन्त में उसने उन
आदमियों को कहा—'' मैं तुम में से हर एक को एक हाथ की एक
लकड़ी दूँगा और ऐसा होगा कि जो चोर है उसकी लकड़ी औरों की
लकड़ी से एक अंगुल (इंच) लम्बी हो जायगी । ऐसा कहकर न्याय-
कर्ता ने हर एक आदमी को एक लकड़ी देकर उनको विदा किया ।''
रात में चोर ने डर कर अपने मनमें सोचा—''यदि मैं अपनी लकड़ी
में से एक अंगुल काट डालूँ तो सवेरे मेरी लकड़ी और लकड़ियों के
बराबर लम्बी रहेगी । '' ऐसा सोच कर अपनी लकड़ी में से उसने
एक अंगुली काट डाला और दूसरे दिन सवेरे और लोगों के साथ
उपस्थित हुआ न्यायकर्ता ने लकड़ियों को देखकर चोर को पकड़ लिया

Section II

COMPOSITION

Give an account of some journey or expedition
you have lately undertaken. Describe the object
of your journey, the means of reaching your
destination, the incidents of the journey, the
place on arrival, the success of your undertaking,
and your return home.

[*Do not write less than* five *or more than* eight
pages of your answer book.]

Intermediate Examination Papers, 1914

ENGLISH

FIRST PAPER

[Answers to SECTIONS I *and* II *must be written in separate books].*

Section I

1. Answer *one* of the following questions :—

Either (*a*) State the reasons given by Socrates to Crito for his refusal to try to escape from prison.

Or (*b*) Give in the substance of Mr. MacNaghten's address on Money.'

2. Explain *any two* of the following phrases with reference to the context in which they occur in the prescribed books :—

(*a*) 'Comptroller-General of the London Cries.'
(*b*) 'That miserable " Windsor Castle" outcry.'
(*c*) ' A public maintenance in the Prytaneum.

3. Parse the words in italics in the following sentences :—

' Then I do not think that it will come to-day, *but* to-morrow. I judge from a *certain* dream which I saw a little *while ago* : so it *seems* to be fortunate that *you did* not *wake* me.

Section II

4. Give in simple language the full meaning of *one* of the following passages :—

Either (*a*) ' I shall pass over many other ac-
cidents of less moment, and hasten to that fatal
catastrophe, when I fell into the hands of an art-
ist, who conveyed me underground, and with an
unmerciful pair of shears. cut off my titles, clip-
ped my brims, retrenched my shape, rubbed me
to my inmost ring, and in short, so spoiled and
pillaged me, that he did not leave me worth a groat.
You may think what a confusion I was in, to see
myself thus curtailed and disfigured.

or (*b*) ' I could wish that the clergy would
inform their congregations that there is no occa-
sion to scream themselves hoarse in making the
responses that the towncrier is not the only
person qualified to pray with due devo-
tion ; and that he who brawls the loudest may,
nevertheless, be the wickedest fellow in the
parish. The old women too in the aisle might
be told, that their time would be better employed
attending to the sermon, than in fumbling over
their tattered testaments till they have found
the test.

5. Explain and give the context of *any two*
of the following sentences :—

(*a*) There is such a thing as ignoble economy
as well as noble extravagance.

(*b*) On that occasion I alone of all the presi-
dents opposed your illegal action and gave my
vote against you.

(*c*) It gives to your body, and it gives to your
mind, a strength and a pliancy which only use and
habit can confer.

(*d*) 'He revolved through the family system like a vagrant comet in its orbit, sometimes visiting one branch, and sometimes another quite remote.

6. (*a*) Analyse the following sentence: 'Let us beg in again, then, and see what is the charge which has given rise to the prejudice against me, which was what Meletus relied on when he drew his indictment.

And (*b*) Turn the following passage into Indirect Speech as reported by the person addressed:—
"My friend," says Sir Roger, "found me out this gentleman, who is, they tell me, a good scholar, though he does not show it. I have given him 'the parsonage of the parish ; and because I know his value, have settled upon him a good annuity for life. If he outlives me he shall find that he was higher in my esteem than perhaps he thinks he is."

SECOND PAPER

[*Answers to Sections I and II must be written in separate books*]

1. Explain in simple English any *two* of the following passages, stating the circumstances under which they occur in the poem :—

(*a*) Yet rest thee God ! for well I know
    I ne'er shall find a nobler foe.
    In all the northern counties here,
    Whose words is Snaffle, spur and spear,
    Thou wert the best to follow gear !

'Twas pleasure, as we looked behind,
To see how thou the chase couldst wind,
Cheer the dark bloodhound on his way,
And with the bugle rouse the fray!

(*b*) And when the priest his death-prayer had
      pray'd,
— Thus unto Deloraine he said :—
  ' ow, speed thee what thou hast to do,
Or, Warrior we may dearly rue,
For those, thou may'st not look upon,
Are gathering fast round the yawning stone!'

(*c*) Land of my Sires ! what mortal hand
    Can e'er untie the filial band,
    That knits me thy rugged strand !
    Still, as I view each well-known scene,
    Think what is now, and what has been,
    Seems as, to me of all bereft,
    Sole friends thy woods and streams were left
    And thus I love them better still,
    Even in the extremity of ill.

2. Explain, with reference to the context,
any *three* of the following :—

  (*a*) In pride of power, in beauty's bloom,
      Had wept o'er Monmouth's bloody tomb !

  (*b*) For mass or prayer can I rarely tarry,
      Save to patter an Ave Mary,
      When I ride on a Border foray,

  (*c*) Lo, Warrior! now, the Cross of Red
      Paints to the grave of the mighty dead ;

(d) Much he marvell'd a knight of pride,
   Like a book-bosomed priest should ride.
(e) Sure some fell fiend has cursed our line.
   That coward should e'er be son of mine.

3.   Give a clause analysis of 1 (c) from the words 'Still, as I view' to ' were left.'

4.   ' We claim from thee William of Deloraine,
   That he may suffer march-treason pain.'

What is 'march-treason pain ? Briefly describe the condition of the Borders at the time of the action of the poem, and some of the measures adopted for the preservation of order.

Section II

5.   The Close of the Mediæval Age.

For, indeed, a change was coming up the world, *the meaning and direction of which even still is hidden from us*, a change from era to era. *The path trodden by the footsteps of the ages were broken up* ; old things were passing away, and the faith and the life of ten centuries were dissolving like a dream. Chivalry was dying ; the abbey and the castle were soon together to crumble into ruin ; and all the forms, desires, beliefs, convictions of the old world were passing away, never to return. *A new continent had risen up beyond the western sea.* The floor of heaven, inlaid with stars, *had sunk back into the infinite abyss* of immeasurable space ; and the firm earth itself, *unfixed from its foundations*, was seen to be but a small atom in the awful vastness of the universe.

In the fabric of habit, *which they had so labori-ously built up for themselves,* mankind were to remain no longer.

(*a*) Explain the parts italicised in the above.

(*b*) Exemplify, with reference to India, the process described here.

6. Explain the meaning of the following phrases giving a short illustrative sentence in each case :—.

(*o*) To be concerned for.

(*b*) To be related of.

(*c*) To accord with.

(*d*) To be disposed of.

(*e*) To account for.

THIRD PPAPER
COMPOSITION

[For candidates whose mother-tongue is English.]

1. Write an Essay on *one* of the following subjects :—

(*a*) The influence of climate on character.

(*b*) The choice of a career.

2. Amend the construction or phraseology of the following sentences :—

(*a*) He was re-appointed after being dismissed through the exertions of his friends.

(*b*) He came out successful, and which made him proud.

(*c*) I have nothing to do with those sort of things.

(*d*) Nobody in their sense would think of such a thing.

(*e*) The three first years of his reign was a happy period.

(*f*) I write to cordially thank you for your good wishes.

(*g*) I have heard of him doing that before.

3. Turn into a Reported Speech :—
    'O Douglas, for thy leading wand !
    Fierce Randolph, for thy speed.
    O for one hour of Wallace wight
    Or well-skilled Bruce to rule the fight.
    And cry, Saint Andrew and our right !'

4. When may *that* and *which* be used as Relative Pronouns ? Illustrate by sentences.

5. Analyse, showing carefully the relation of the clauses :—

No man should be ashamed to own he has been wrong, which is but saying in other words, that he is wiser to-day than he was yesterday.

URDU

THIRD PAPER

[Answers to Sections I and II are to be written in separate books.]

Section I

Translate :

ایک بار میں ایک اسکول ایک ایسی زمین پر تعمیر کرہا تھا,
جس میں ایک گهرا اور خالی کواں تھا - اور بالکل عمارت کے نیچے.

بچّتا تھا اسلئے میں نے یہ فیصلہ کیا کہ اُس پر ایک محراب بنا دیا جاۓ
اور چونکہ اُسکے بھرنے میں کچھ کچھ خرچ کرنا پڑتا اسلئے میں نے چاہا کہ
بغیر بھرے ہوۓ یہ کام کردیا جاۓ لیکن میرے بتھئے مستری نے جو کہ
اگرچہ اپنا نام بھی نہیں لکھ سکتا تھا مگرعملی تعمیر کے متعلق سب
کچھ جانتا تھا سر ہلایا اور کہا ایسے کام میں یہ ہاتھ نہ ڈالیگا۔
میں نے دریافت کرنے کی جرأت کی کہ " آخر کیوں " اُس نے کہا
" اسلئے کہ شاستروں نے کہا ہے کہ ایسا ہرگز نہیں کرنا چاہئے " میں
نے پوچھا " مگر وہ کیا بتاتے ہیں کہ واقع ہوگا اگر غیر مستعمل کوئیں
کو بغیر بھرے ہوۓ قہانپ دیا جاۓ " اُسکے جواب دیا کہ " وہ بھوتوں
سے بھر جائیگا ۔ اور نہایت برے بھوتوں سے اور جتنے ہی زیادہ مدت
اُس کے اندر وہ مقید رہینگے اوتنے ہی زیادہ وہ مہلک ہونگے " میں نے
خوراً سمجھ لیا کہ اُسکے بھوت دراصل گیس یا ایتھرے ہیں ۔ مگر اُس
بتھئے آدمی کی بات نے مجھے یہ تعلیم دی کہ ایک سچ بات کو غلط
نام دیکر یاد رکھنا اور کام میں لانا اس سے بہتر ہے کہ اُسکو صحیح نام
دیں اور بھول جائیں *

HINDI

*[Answers to Sections I and II are to be written
in separate books.]*

Section 1

Translate :—

एक समय मैं एक पाठशाला का मकान बना रहा था, ऐसी
ज़मीन पर जहां एक गहरा खाली (सूखा) कूआं था । यह कूआं एक
दम बीच में पड़ता था इसलिये मैंने यह निश्चय कर लिया कि उसके
ऊपर एक मेहराव बनाऊं । और इस कूप को भरने में कुछ खर्चा

पड़ता इससे मैंने यह स्थिर कर लिया कि उसको बिना भरे ही उसके ऊपर मेहराब बनादूं । पर मेरे बूढ़े मिस्त्री ने—जो यद्यपि अपना नाम तक नहीं लिख सकता था तथापि मकान बनाने का कुछ काम जानता था—अपना सिर हिला कर मुझसे कहा कि ऐसे काम में वह किसी तरह हाथ नहीं डालेगा । मैंने पूछने का साहस किया—“क्यों ?” उसने कहा—“क्योंकि शास्त्रों में कहा है कि ऐसा नहीं करना चाहिये ।” मैंने पूंछा “एक व्यर्थे पड़े हुये कूप को यदि कोई बिना भरे ढाँक दे तो क्या होगा—इसके प्रसङ्ग शास्त्र क्या कहते हैं ?” उसने उत्तर दिया —“ ऐसा कूप भूतों से भर जायगा । और ये भूत बहुत बुरे होंगे । ये जितने दिन बन्द रक्खे जायंगे उतने ही अधिक भयङ्कर (हिंसक) होंगे ।” मैं उसी चए समझ गया कि ऐसी जगहों से जो हवा या भाप निकलती है उसी को यह “ भूत ” कहता है । परन्तु उस बूढ़े आदमी के वचन ने मुझे यह सिखाया कि एक सच बात को सही (शुद्ध) नाम देकर भूल जाने से यह अच्छा है कि वह ग़लत (अशुद्ध) नाम से ही याद रक्खी जाय और काम में लाई जाय ।

Section II

Write an essay, covering five or six pages of the answer-book, describing a favourite game or sport. relating (if you like) some incident or incidents connected with it and adding a few remarks on the utility of open exercise.

ENGLISH

FIRST PAPER

Section I

1. Give in simple English the full meaning of *one* of the following :—

Either (*a*) This court of the past differs from all living aristocracy in this:—it is open to labour and to merit, but to nothing else. No wealth can bribe, no name overawe; no artifice deceive, than guardian of those Elysian gates. In the deep sense, no vile or vulgar person ever enters there. At the portieres of that silent Faubourg St. Germain, there is but brief question. 'Do you deserve to enter ? Pass. Do you ask to be the companion of noble ? Make yourself, noble, and you shall be. Do you long for the conversation of the wise ? Learn to understand it, and you shall bear it. But on other terms ?—no. If you will not rise to us, we cannot stoop to you.

Or (*b*) Hither, then, as to a sort of ideal land, where all the archetypes of the great and the fair were found in substantial being, and all departments of truth explored and all diversities of intellectual power exhibited, where taste and philosophy were majestically enthroned as in a royal court, where there was no sovereignty but that of mind, hither flocked continually from the very corners of the

'orbis terrarum' the many-tongued generation, just rising, or just risen into manhood; in order to gain wisdom.

2. Explain, the reference to the context, any *two* of the following :—

(*a*) How am I to keep my head clear in the torrent and din of works, all of which distract my attention most of which promise me something, whilst so few fulfil that promise ? The Nile is the source of the Egyptian's bread, and without it he perishes of hunger. But the Nile may be rather too liberal in his flood, and then the Egyptian runs imminent risk of drowning.

(*b*) Already there existed, in secret, everywhere a considerable opposition party ; witnesses of the Waverley miracles, but unable to believe in them, forced silently to protest against them.   Such opposition party was in sure case to grow ; and even, with the impromptu process ever going on, ever waxing thinner, to draw the whole world over to it.

(*c*) He does not look at things exactly with his own eyes, he has not impressions of his own, we could not discover the imagination with which he started.   'Tis a tree on which have been grafted Homer, Virgil. Milton, Dante, Petrarch ; hence have grown peculiar flowers which are not natural, which are not artificial.

3.   Analyse the following sentence :—

(*a*) If at any time we ask *what* our duty is honestly seeking to do it, we shall find an answer,

the best of all answers, in that voice of conscience within us all, to which in my first lecture I referred *as a something* divine, as a voice from God.

(*b*) Parse the words in italics in (*a*)

Section II

4. Write a brief essay on *one* of the following subjects :—

(*a*) The Socratic method as exemplified in the *Dialogues.*

Or (*b*) 'The Advantages of Collegiate Education,' as indicated by MacNaughten.

5. Write explanatory notes, referring to the passages in which they occur, on *any three* of the following :—

(*a*) He would not have obtained the fifth part of the votes, and would have had to pay a fine of a thousand drachmæ.

(*b*) No, it has not actually arrived: but I think that it will be here to-day, from the news which certain persons have brought from Sunium, who left it there.

(*c*) To pass from anything that is simply laborious to the indulgence of a taste or liking, is the fruition of life.

(*d*) It is not everybody who can bend the bow of Ulysses, and most men only do themselves a mischief by trying to bend it. If we are now on our way to a quieter style, I am not sorry for it. Truth is quiet.

5

...(e) The lower orders of spectators in general—
nay, many of the higher class, were rather disap-
pointed at the champions choosing the arms of
courtesy.

6. Turn into indirect speech.

Good, said Simmias ; I will tell you my diffi-
culty and Cebes will tell you why he is dissatisfied
with your statement. I think, Socrates, and I
dare say you think so too, that it is very difficult,
and perhaps impossible, to obtain clear knowledge
about these matters in this life.

SECOND PAPER

[Answers to Section I and II must be written in separate books.]

Section 1

1. Give briefly, and in simple English, the
meaning of the following passages :—

(a) Harold was born where restless seas
   Howl round the storm-swept Orcades ;
   Where erst St. Clairs held princely sway
   O'er isle and islet, strait and bay :—
   Still nods their palace to its fall,
   Thy pride and sorrow, fair Kirkwall !

(b) From trencher stole his choicest cheer
   Dash'd from his lips his can of beer;
   Then, to his knee sly creeping on ,
   With bodkin pierced him to the bone :
   The venom'd wound, and festering joint,
   Long after rued the bodkin's point.

(c) On Minto-crags the moonbeams glint ;
    Where Barnhill hew'd his bed of flint ;
    Who flung his outlaw'd limbs to rest,
    Where falcons hang their giddy nest,
    Mid cliffs, from whence his eagle eye
    For many a league his prey could spy,

2. Explain with reference to the context:—

(a) For pride is quell'd, and love is free.

(b) And Yarrow as he roll'd along,
    Bore burden to the Minstrel's   song.

(c) On the drawbridge the worders stout
    Saw a tarrier and lurcher passing out,

(d) When Hawick he pass'd, had curfew rung.
    Now midnight lauds were in Melrose sung.

3. State briefly the origin, and account for
the success, of *The Lay of the Last Minstrel*.

4. Give a clause analysis of I (c).

Section II

5. The *plantation* of Ireland with English
settlers was part of a large scheme of colonization
and *expansion*, which began to *fill the imagina-
tions* of Elizabethan statesmen and *seamen* to-
wards the close of the sixteenth century. Dawn
to the time of the Spanish Armada, Spain and
Portugal, the discoverers of the new lands and the
hitherto unknown seas, *had jealously kept their
new possessions to themselves.* When in 1588 *the
combined Spanish and Portuguese power was
broken*, the sailors of England, France, Holland,
Sweden, and other lands *found the Old World of*

*the East and the New World of the West alike
open to them.* Even before 1588, however, English
seamen had ventured to trespass. Cabot from
Bristol, so early as 1497, crossed to the American
coast. John Hawkins in 1562 tried to develope
trade with the Spanish West India ; but the
Spaniards stopped him. Then Drake, his nephew,
took to piracy, and did incalculable damage to
Spanish fleets and coast settlements ; on one of his
piratical excursions he reached the Pacific and sail-
ed round the world. Sir Humphrey Gilbert made
an attempt to colonize Newfoundland, Sir Walter
Raleigh led a band of settlers to Virginia ; but
neither expedition was successful. Finally, in
1600, the East India Company was formed, and,
having obtained a *charter* from Elizabeth, sought
to open up direct trade with the East. It was a
time of marvellous activity and adventure. Well
has a poet sung of '*the spacious days* of great
Elizabeth.'

(*a*) Explain the italicised parts of the above
passage.

(*b*) ' Even before 1588, however, English sea-
men had ventured to *trespass*.'

6. Explain the meaning of the following phra-
ses, illustrating their use by short sentences :—

    (*a*) To make up to.
    (*b*) To be haunted by.
    (*c*) To precipitate.
    (*d*) To accede to.
    (*e*) By virtue of.

ENGLISH COMPOSITION

[For candidates whose mother-tongue is English.]

1. Write an essay on ' The Love of Nature,' with reference to some or all of the following topics :—

(*a*) Natural scenery. (*b*) Nature-study. (*c*) Pet animals. (*d*) Sport. (*e*) The treatment of nature by the poets.

2. Analyse fully in tabular form :—
Then from the dawn it seemed there came, but faint,
As from beyond the limit of the world,
Like the last echo born of a great cry,
Sounds, as if some fair city were one voice
Around a king returning from his wars.

3. Correct or amend the following :—

(*a*) This stone is erected to the memory of John Smith accidentally shot as a mark of affection by his brother.

(*b*) James as well as Thomas are coming.

(*c*) Why don't you do like I do ?

(*d*) Another mode of spending the leisure time is that of books.

4. How is the want of inflections in English applied ? Give examples.

5. Give some examples of Noun-suffixes and Adjective-suffixes.

6. Punctuate :—
Very ready we are to say of a book how good this is that's exactly what I think but the right

feeling is how strange this is I never thought of
that before and yet I see it is true or if I do not
now I hope I shall some day.

URDU

THIRD PAPER

Section I

Translate :—

قارس میں اور ہندوستان کے بعض حصوں میں ایک مثل مشہور
ہے :—''باز لڑکے کو اُٹھا لے گیا اور چوہا لوہا لے گیا ''—یہ ذیل
کی کہانی کی طرف اشارہ کرتی ہے :—ایک آدمی نے سفر کو جاتے وقت
کچھ من لوہا ایک سوداگر دوست کے پاس امانت رہا – کئی سال کے
بعد وہ واپس آیا اور اُس دوست سے وہ لوہا منگوا بھیجا – اُس
سوداگر نے جسکے پاس لوہا امانت تھا بد دیانت ہونے کے سبب سے لوہا
بیچ لیا تھا اور اب کہلا بھیجا کہ مجھے بہت افسوس ہے کہ لوہا چوہے
کھا گئے – اس جواب سے دوسرے سوداگر کو کس قدر تعجب ہوا – جو
کچھ نہ سمجھے سکا نہ چوہوں نے لوہے کو کیسے توڑا اور کیونکر چبا
گئے – تو بھی اُسنے اس معاملہ میں لڑتی بحث نہ کی بلکہ سیدھا اُس
جگہ گیا جہاں چھوٹے سوداگر کا بیٹا کھیل رہا تھا – اُس لڑکے کو پھسلا
کر کسی پوشیدہ مقام پر لے گیا – سوداگر اپنے لڑکے کا کیو جانا معلوم کرکے
غم سے دیوانہ سا ہوگیا – وہ اپنے بال نوچتا اور ہر جگہ چیختا چلاتا
پھرتا تھا ''میرا بیٹا ! میرا بیٹا کہاں ہے ؟'' دوسرے سوداگر نے اُسکو
ایسی مصیبت میں دیکھکر دریافت کیا کہ کیا ہوا ؟ اُسے جواب ملا کہ
چھوٹا لڑکا یا تو بھٹک گیا ہے یا اُسے کوئی چرا لیگیا – اُسنے کہا '' افسوس
میں نے ایک بڑے سے باز کو لڑکے کے سر پر منڈلاتے دیکھا تھا – وہ
چرندہ.ضرور اُسے اُڑا لیگیا ہوگا'' – غمزدہ سوداگرنے کہا ''تم میری مصیبت

میں مجھ پر تھوڑا ترس ہو ۔ باز تیونکر میرے لڑکے کو اُٹھا لیتا

سکتا ہے؟ ''دوسرے سوداگر نے جواب دیا ''ایسی آسانی سے جیسے چھوٹم

لوہم کو کھا گئے '' ۔ نتیجہ یہ ہوا کہ تھوڑا ہوا لڑکا تھوڑے ہوئے لوہے

کے بدلے میں واپس مل گیا ۔ ٭

HINDI

Translate :—

फ़ारस (पर्शिया) में और भारतवर्ष के कई मान्तों में एक कहा-
वत प्रसिद्ध है—''बाज़ बच्चे को ले गया, चूहा लोहा खा गया'' । यह
कहावत निम्नलिखित कहानी की सूचित करती है :—

एक आदमी, जब सफ़रको जा रहा था, कई मन लोहा अपने एक
मित्र वनिये के जिम्मे किया । कई वरसों के वाद वह लौटा और अपने
मित्र से लोहा मँगवा भेजा । वह वनिया, जिसके जिम्मे लोहा था,
शैतान (ठग) था, उसने लोहे को वेच डाला था और अब कहला भेजा
कि मुझे खेद है चूहे लोहे को खा गये । इस उत्तर से दूसरे वनिये को
कुछ आश्चर्य हुआ । वह नहीं समझ सका कि लोहा कैसे चूहों से तोड़ा
और चबाया जा सका । तौभी उसने इस पर वातों से वाद विवाद नहीं
किया । वह सीधा उस जगह चला गया जहां उस झूठे वनिये का वच्चा
खेल रहा था, और उसको फुसलाकर एक गुप्त स्थान में ले गया । अब
वनिये ने देखा कि उसका वच्चा खो गया है शोक से पागलसा हो गया
अपने वाल नोचता हुआ चिल्लाता फिरा-'' मेरा वच्चा ! मेरा वच्चा
कहां है ?'' ऐसी विपत्ति में उसे देख कर दूसरे वनिये ने पूछा कि क्या
घात है वससे कहा गया कि छोटा वच्चा कहीं भटक गया है या किसी
ने वसे चुरा लिया है । वसने कहा—''हां ! हमने एक वड़े वाज़ को एक
लड़के के सिर पर मड़राते (वड़ते) देखा—वड़ी चिड़िया उसको

लेकर उड़ गई होगी" । शोकाकुल वनिये ने कहा—'' तुम विपत्ति में
मुझ से ठट्टा करते हो ! वाज़ कैसे मेरे लड़के को ले जा सका होगा ?''
दूसरे वनिये ने कहा—''वह वैसी ही आसानी से वसे ले गया होगा
जैसे चूहे लोहे को खा गये '' ।

परिणाम यह हुआ कि खोया हुआ लड़का खोए हुये लोहे के वदले
वापस हुआ ।

Section II

Write a letter to a former school-fellow or other
friend, describing the course of your life since the
time of your leaving school, and including any
incidents or scenes of special interest with which
you have met.

[*The letter should cover from four to six pages
of ordinary writing.*]

Intermediate Examination Papers, 1916

ENGLISH

FIRST PAPER

Section I

[Answer to Section I and II must be written in separate books.

1. Answer *one* of the following questions:—

Either, (*a*) Write a brief essay on the subject: 'Self-discipline is grounded on self-knowledge (Helps).

    Or, (*b*) Show how the *Apology* illustrates the moral courage of Socrates.

2. Explain, in *any*, *three* of the following sentences, the figurative expression printed in italics:

(*a*) We may insist upon a routine of proprieties being performed with soldier-like precision, but *there is no drilling of men's hearts.*

(*b*) Conncils and commissions *are the fly-wheels and safety-valves of the machinery of business.*

(*c*) I certainly shall not agree to your proposal, not even though the power of the multitude should scare us with fresh terrors, *as children are scared with hobgoblins.*

(*d*) Mere scholarship and learning and the knowledge of books do not by any means *arrest and dissolve all the travelling acids of the human system.*

· (c) I must describe to you the wanderings
which I undertook, *like a series of Heraclean la-
bours*, to make full proof of the oracle.

3.   Parse the words printed in italics in the
following sentence :—

Nothing *but* truth in all the main plan, and
thorough completeness through all its functions
in the school machinery, *both* indoors and out can
make boys *feel* that the school is *but* one body,
one army; that masters and boys are united in
one-life, with one standard *round* which they rally.

Section II

4.   Give in simple English the full meaning
of *one* of the following passages :—

Either, (*o*) As I look back and think of those
cataracts of printed stud which honest compositors
set up meaning. Let us trust no harm, and which
at least found them in daily bread—painted stuff
which I and the rest of us, to your infinitely
small profit have consumed with our eyes not
even making an honest living of it, but much
impairing our substance—I could almost reckon
the printing press as amongst the scourges of
mankind I am grown a wiser and a sadder man,
importunate, like that Ancient Mariner, to tell
each blithe wedding guest the tale of his ship-
wreck on the infinite sea of printers' ink, as one
escaped by mercy and grace from the region
where there is water, water everywhere, and not
a drop to drink.

Or, (*b*) It is not the object of education to turn
a woman into a dictionary ; but it is deeply
necessary that she should be taught to enter
with her whole personality into the history she
reads ; to picture the passages of it vitally in her
own bright imagination ; to apprehend, with her
fine instincts the pathetic circumstances and
dramatic relations, which historian too often only
eclipses by his reasoning, and disconnects by his
arrangement ; it is for her to trace the hidden
equities of divine reward, and catch sight, through
the darkness, of the fateful threads of woven
fire that connect error with its retribution.

5. Explain simply in your own words and give
the context of any *two* of the following sentences:—

(*a*) Let your Mentor be a person of nice con-
science, for such a one is less likely to fall into
that error to which we are all so liable, of advis-
ing own friends to act with less forbearance, and
with less generosity, than we should be inclined
to show ourselves, if the case were our own.

(*b*) One day the Constable mountain, which
seemed to stand strong like the other rock moun-
tains, gave suddenly, as the icebergs do, a loud-
sounding crack ; suddenly, with huge clangour,.
shivered itself into ice-dust ; and sank carrying.
much along with it.

(*c*) You have not gained very much time,
Athenians, and, as the price of it, you will have
an evil name from all who wish to revile the
city, and they will cast in your teeth that you put
Socrates, a wise man, to death.

6. (a) Socrates, addressing Crito, said:

'I cannot set aside my former arguments because this misfortune has come to me. They seem to me to be as true as ever they were; and if we have no better reasoning to substitute for them, I certainly shall not agree to your proposal.'

Turn the above passage into Indirect Speech, as reported by Crito.

(b) Give a clause analysis of the following passage:—

The best you can do, even though you may be a well-educated person, is to be silent, and strive to be wiser every day, and to understand a little more of the thoughts of others, which so soon as you try to honestly, you will discover that the thoughts even of the wisest are very little more than pertinent questions.

SECOND PAPER

[Answer to Sections I and II must be written in separate books.]

Section I.

1. Explain, in simple English, with reference to the context, any *two* of the following passages:—

(a) The horse, whom Rustam on foray once
Did in Bokhara by the river find
A colt beneath its dam and drove him home,
And rear'd him; a bright bay, with lofty crest;

Dight with a saddle cloth of broider'd
    green
Crusted with gold, and on the ground
    were work'd
All beasts of chase, all beasts which
    hunters know.

(b) As when some hunter in the spring hath
    found
A breeding eagle sitting on her nest.
Upon the craggy isle of a hill-lake,
And pierc'd her with an arrow as she rose,
And follow'd her to find out where she fell
Far off;—anon her mate comes winging
    back.
From hunting, and a great way of descries
His huddling young left sole.

(c) Not like that Arthur who, with lance in
    rest,
From spur to plume a star of tournament
Shot through the lists at Camelot, and
    charged
Before the eyes of ladies and of kings.

2. Explain, with reference to the context, any
three of the following passages :—

(a) Light men, and on light steeds, who only
    drink,
The acid milk of camels, and their wells.

(b)   As a cunning workman, in Pekin
Pricks with vermilion some clear por-
    celain vase,
An Emperor's gift.

(c) Authority forgets a dying king
　　Laid widow'd of the power in his eye
　　That bow'd the will.

(d) 　　Like a streamer of the northern morn,
　　Seen where the moving isles of winter
　　　　shock
　　By night, with noises of the northern sea.

(e) For so the whole round earth is every way
　　Bound by gold chains about the feet of
　　　　God.

3.　What do you understand by an 'Allegory'
and a 'Legend'?

4.　Explain any *three* of the following :—
greaves ; sands of life ; swarthy webs ; sky-neigh-
bouring mountains ; lief ; parcell'd Oxus.

Section II

5.　England was struggling once more for *the
command of the seas* and the right to trade, as she
had fought against Spain in the days of Elizabeth.
Desperate was the fighting on both sides, for both
knew that *an empire was at stake.* Holland
suffered much from attacks upon the merchant ships.
Her herring-fleet was captured in the first year of
the war, *her ports were blockaded*, and ships laden
with merchandise were seized in every harbour.
Jamaica, an island in the West Indies, was taken
and *became an important centre of English
Commerce in the Atlantic.* But Holland was only
seeking time *to recruit* ; she had *suffered reverses,*
she was not yet vanquished. Meanwhile the East
India Company had succeeded in India : *the Dutch
were no longer to be feared.*

Give the meaning of the parts italicised in the above passage.

6.   In his own pavilion Rustum sought his bro-ther's side and spent the night in prayer and medi-tation and sweet refreshing sleep.   He gave in-structions to his brother : ' Prepare my warriors before-sunrise, and if, when I meet again the valiant Tartar, I *issue* forth** the *victor,** lead them to share the glory.   But if, on the other hand, this stripling overcomes, take my brave troops off the field to Zabul, and do not think of restraining the advance of the Tartars.   Comfort the venerable Zal, and gently tell the sad *news* to dear Rudabeh, my mother; soothe her with your tenderest care.   Say *it** is the will of Heaven that the brave, the old and young, must die.'

(*a*)   Give briefly in your words the substance of the above passage.

(*b*) Put into indirect speech the instructions given by Rustum to his brother.

(*c*) Parse the words marked with an asterisk in the above passage.

THIRD PAPER

[*For candidates whose mother-tongue is English.*]

1.   Write an essay on ' The veneration for an-tiquity : its uses and abuses.'

2.   Analyse fully in tabular form :—

This too thou know'st that while I still bear on
The conquering Tartar ensigns through the world,
And beat the Persians back on every field,

I seek one man, one man and one alone—
Rustum, my father ; who I hoped should greet,
Should one day greet, upon some well-fought field,
His not unworthy, not inglorious son.

3.   Correct or amend the following :—

(a) I did not dine yesterday as I wished.

(b) The sway of England is greater and more glorious than ancient Rome.

(c) The ship was insured for a voyage from London to Bombay with a cargo of cement.

(d) They had no sooner risen but they began to work.

4.   Give one example of each of the following:—

(a) ' But ' as a preposition ;

(b) ' As ' as a relative pronoun ;

(c) A present participle used absolutely ;

(d) A gerundial infinitive having the force of an adjective.

5.   Turn into Indirect Speech :—

Then spoke King Arthur, breathing heavily,
' What is it thou hast seen ? or what hast heard ?
' And answer made the bold Sir Bedivere :
' I heard the water lapping on the crag,
And the long ripple washing in the reeds.'

6.   Punctuate :

What is rightly called reading consists in watch ing every accent and expression and putting our selves always in the author's place annihilating o

own personality and seeking to enter into his so
as to be able assuredly to say thus Milton thought
not thus I thought in mis-reading Milton.

THIRD PAPER (URDU)
[Answers to Section I and II are to be written in
separate books.]
Section I

Translate :—

ایک مصنف کا قول ہے کہ شرافت نہ تو خیالات پر نہ زرق برق
لباس پر منحصر ہے ۔ عمدہ کپڑے عمدہ عادتوں کے برابر نہیں ہوتے ۔
شریف آدمی نرم مزاج ۔ پُر حیا ۔ خلیق اور فیاض ہوتا ہے ۔ اور
بعض اُسکی شکل دیکھکر ہم یہ نہیں بتا سکتے کہ آیا ان میں یہ
اوصاف موجود ہیں یا نہیں ۔ ذیل کے قصہ سے معلوم ہوتا ہے کہ صرف
ظاہر کو دیکھکر کسی کے نسبت رائے قائم کرنا کسقدر بیوقوفی کا امر ہے :—

قریب ایک سو سال کا زمانہ گذرا کہ ملک روس کے اُمراءمین ارلف
(Orloff) نامی ایک شخص تھا جو کہ تمام جہان میں سب سے طاقتور
آدمی کہا جاتا تھا ۔ وہ آسانی سے اُن طاقت کے کاموں کو کرسکتا تھا
جنکو معمولی آدمی ہمت کرتے کا خیال بھی نہیں کرسکتا تھا ۔ ایک شب
کر دور دراز کے سفر کے بعد اپنے مکان پر آکے ارلف نے سنا کہ محل
شاہی سے ایک قاصد آیا تھا جو اُسکو ایک بہت ضروری کام کے لئے بلایاگیا
ہے ۔ بغیر غسل کئے ہوئے یا کپڑے بدلے ہوئے ارلف فوراً روانہ ہوگیا ۔
محل شاہی کے دربان نے اُسکو نہ پہچانا اور ایک گرد آلودہ اور سفر زدہ
اجنبی کو حضور شاہی میں جانے کی اجازت نہ دیا اور کہا ۔ " میں
جاننا چاہتا ہوں کہ تم کون ہو کہ میں تمکو اس حالت میں محل کے
اندر جانے دوں ؟ " ارلف ایک لفظ بھی نہ بولا اور ایک بڑا لوہے کا

6

، سیلف جونہ رات کو دروازہ بند کرنے کے کام میں لایا جاتا تھا اُٹھا لیا اور
اپنے مضبوط ہاتھوں کو جلدی سے اینٹھ کر دربان کے گلے میں اُس لوہے
کو مڑوڑ دیا اور کہا '' ابجی حضرت اب اُس پٹے کو گلے میں ڈالے ہوئے
لوگوں کو اپنی شکل دکھلاؤ اور تب ذرا معلوم ہوجائیگا کہ میں کون
ہوں '' ۔ دربان نے ذرا سمجھیہ لیا کہ یہ شخص ارلف قوی تن ضرور
ہوگا جسکی طاقت کے نسبت عجیب عجیب تھے مشہور ہیں اور جو وہ
جانتا تھا کہ دربار روس میں ایک منیبور آدمی ہے ۔ خوف کے مارے
دوزانو ہوکر گرا اور امیر سے معانی مانگی ۔ ارلف صرف ہنس پڑا اور
کہا کہ پھر کبھی کسی شخص کے نسبت اُسکا ظاہرا دیکھکر کوئی راے
مت قائم کرنا *

THIRD PAPER (HINDI)

[Answers to Section I and II are to be written in separate books.]

Section I

Translate :—

एक ग्रन्थकार कहता है—"सभ्य होना दर्जा वा वेश पर नहीं निर्भर
है । अच्छे कपड़े अच्छे चाल के बराबर नहीं होते । सभ्य मनुष्य सौम्य
विनीत सुशील तथा वदार होता है । किसी आदमी में ये गुण हैं वा
नहीं—हम उसको देखने ही से नहीं जान सकते । निम्नलिखित कहानी
यह दिखलाती है कि किसी आदमी को केवल देख कर उसके प्रसङ्ग
राय स्थिर करना कैसी मूर्खता है ।

लगभग एक सौ वरस हुए श्रोर्लाफ़ (Orloff) नाम का एक
रूसी अमीर था जो कि संसार में सबसे अधिक बलिष्ठ कहा जाता था
जिन बक्ष के कामों के करने की सम्भावना भी और लोगों के मन में नहीं

आती थी ऐसे कामों को वह आसानी से कर सकता था । एक रात
खम्बे सफ़र के बाद घर आने पर काउंट ऒर्लाफ़ (Count Orloff
ने सुना कि राजभवन से एक दूत आया था यह आज्ञा लेकर कि किसी
एक बड़े काम के सम्बन्ध में वे राजभवन में तत्क्षण उपस्थित हों । उसी
क्षण बिना नहाये धोये या कपड़ा बदले वे जल्दी से चले । राजभवन
के द्वार पर जो द्वारपाल था उसने उनको नहीं पहचाना और धूल से
भरे और भ्रमण के मलिन चिन्हों से आच्छन्न अपरिचित आदमी को
बादशाह के सामने जाने देने से इनकार किया उसने कहा–“मैं जानना
चाहता हूँ कि तुम कौन हो, कि मैं तुमको ऐसी अवस्था में राजभवन
के भीतर जाने दूँ” । काउंट ऒर्लाफ़ (Court Orloff) एक शब्द
भी न बोला । जो रात को दरवाज़ा बन्द करने के काम में लाया जाता
था ऐसे एक लोहे के डंडे को उठा लिया और अपने बलिष्ट हाथों को
जल्दी से ऐंठ कर उस लोहे को द्वारपाल के गले में मोड़ दिया । और
कहा—“ए भलमानस ! इसी पट्टे को गले में डाले हुए अपने रूप को
देखलाओ फिर मालूम हो जायगा मैं कौन हूँ” । द्वारपाल ने झट समझ
लिया कि यह अवश्य बलिष्ट ऒर्लाफ़ हैं जिनके बल के प्रसङ्ग में अद्भुत
कहानियाँ कही जाती हैं, और जिनको वह जानता था कि ये राजभवन
में अधिक सम्मानित हैं । डर के मारे द्वारपाल घुटनों के बल गिर पड़ा
और उस अमीर से क्षमा मांगी । ऒर्लाफ़ हँस उठा और कहा कि
फिर कभी मनुष्य के बाहरी रूप से उसके प्रसङ्ग राय स्थिर करने का
प्रयत्न न करना ।

Section II

Write, in the form of a letter to a friend, as
vivid an account as you can of the ordinary daily

life of your college, under the following heads:—

(*a*) Your studies.

(*b*) Your games and sports.

(*c*) Any events of special importance that might have happened during the past year in the history of your college.

[The letter should cover from four to six pages of your answer-book.]

— —

Intermediate Examination Papers, 1917

ENGLISH

FIRST PAPER

[*N. B.—Marks will be deducted for illegible writing and for bad composition.*]

1. (*The answer to this question should not occupy more than three pages of your answer book.*)

Either,

(*a*) Describe the events which led to the marriage between Quentin Durward and Isabelle, Countess of Croye.

Or,

(*b*) Give in your own words the arguments—

(i) by which Socrates showed that death is not an evil.

(ii) by which Crito tried to persuade Socrates to escape from prison.

2. Explain, with reference to the context, the meaning of *any two* of the following:—

(*a*) I would have known thee, boy, in the *landes* of Bordeaux, had I met thee marching there like a crane on a pair of stilts. But come—come, unbuckle your Scottish mail-bag—give us the news of Glen Houlakin.

(*b*) Silence, my lieges! lay not a hand on the man, not a finger on the gage. And you, sir

count, of what is your life composed or how is it
warranted, that you thus place it on the cast of a
die so perilous?

(c) Read not to contradict and confute, nor to
believe and take for granted, nor to find talk and
discourse, but to weigh and consider. Some books
are to be tasted, others to be swallowed, and
some few to be chewed and digested.

3. Give in simple English, in your own words,
the full meaning of *one* of the following
passages :—

Either,

(*a*) There was one charm in Attica, which in
the same perfection was nowhere else. The deep
pastures of Arcadia, the plain of Argos, the Thes-
salian vale, these had not the gift Boeotia, which
lay to its immediate north, was notorious for its
very want of it. The heavy atmosphere of that
Boeotia might be good for vegetation, but it was
associated in popular belief with the dulness of
the Boeotian intellect : on the contrary the special
purity and salubrity of the air of Attica, fit
concomitant and emblem of its genius, did that
for it which earth did not ;—it brought out every
bright hue and tender shade of the landscape.

Or,

(*b*) He found it no easy matter to maintain an
integrity in his words and actions, even in things
that regarded the offices which were incumbent
upon him, in the care of his own affairs and
relations of life, and therefore dreaded (though he

had great talents) to go into employments of state, where he must be exposed to the snares of ambition. Innocence of life and great ability were the distinguishing parts of his character ; the latter, he had often observed, had led to the destruction of the former and used frequently to lament that great and good had not the same signification.

4.   Explain the meaning of *any two* of the following sentences, with reference to the context in which they occur:—

(*a*) A *Plodding Student* is a kind of alchemist or persecutor of Nature.

(*b*) But the Glass coachman still waits ; his fare seemingly incomplete.

(*c*) They were not long in finding an oak, as Petit-Andre facetiously expressed it, fit to bear such an acorn.

(*d*) I think that I am the gadfly that God has sent to the city to attack it.

5.   Turn the following passage (the words of the King) into Indirect Speech as reported by the person addressed:—

" I forgive thy sauciness for thy spirit and shrewdness. I admired how near thou didst hit upon Tristan's occupation. You have nearly tasted of his handiwork since, as I am given to understand. I bid thee beware of him ; he is a merchant who deals in rough bracelets and tight necklaces. Help me to my horse. I like thee, and will do thee good."

6. (*a*) Give a clause analysis of the following passage :—

He was aware that until blows were exchanged he would have the assistance of *most* of the nobles *present* in *moderating* the fury of their prince, *however* angry the latter might be ; but that, *were* a fight once commenced, he himself and his *few* adherents must be instantly murdered.

(*b*) Parse the words printed in italics in the above passage.

SECOND PAPER

(N. B.—*Marks will be deducted for illegible writing and for bad composition.*)

1. Re-write the following passages in clear and simple prose:—

(*a*) The two hosts heard that cry, and quaked for fear,

And Oxus curdled as it crossed his stream.
But Sohrab heard, and quailed not, but rushed on,
And struck again ; and again Rustum bow'd
His head ; but this time all the blade, like glass,
Sprang in a thousand shivers on the helm,
And in the hand the hilt remain ed alone.

(*b*) And so he deem'd that either Sohrab took,
By a false boast, the style of Rustum's son ;
Or that men gave it him to swell his fame.
So deem'd he, yet he listen'd, plunged in thought.

' And his soul set to grief, as the vast tide
Of the bright rocking Ocean sets to shore
At the full moon.

(c)   The great brand
Made lightnings in the splendour of the
  moon.
And flashing round and round, and *whir'ld*
  in an arch,
Shot like a streamer of the northern morn,
Seen where the moving isles of winter *shock*
By night, with noises of the Northern Sea.

2. Explain, with reference to the context,
any *three* of the following :—

(*a*) Like some old miser, Rustum hoards
  his fame,
And shuns to peril it with younger men.

(*b*) Thou dost not slay me, proud and boast-
  ful man !
No ! Rustum slay me, and this filial heart.

(*c*) Authority forgets a dying king,
Laid widow'd of the power in his eye
That bow'd the will.

(*d*) Clothed with his breath, and looking, as
  he walk'd,
Larger than human on the frozen hills.

(*e*)   For all his face was white
And colourless, and like the wither'd
  moon.
Smote by the fresh beam of the springing
  east.

3. Describe in your own words the last scenes of *Sohrab and Rustum*, from the death of Sohrab to the end.

Why, do you think, did the poet introduce a description of the river?

4. Give a clause analysis of 1 (*c*), and parse the words in italics.

5. *Engage the enemy more closely.*

Admiral Beatty, bravest of the brave as he is the coolest and most calculating of strategists. He knew that his duty was to " engage the enemy more closely " *not merely because it is the glorious tradition of the fleet* but because it was the right thing to do at the particular juncture. He knew too that his ships were built to fight and destroy the enemy whenever the chance arose, and *not to be preserved in a glass case.* He knew that *commander's duty is not to save his ship but to risk it.* His squadron was no talent to be laid up in a napkin, but something to be put into the Bank of Battle to earn its profit. When he found the enemy *he did not merely bark at their heels* and ask for help. He did not add up the number of vessels or the number of guns, or work out formal calculations as to the proportions of armour. He had the band of brothers under his command *flew in their hearts, if not at their masts' heads, the old signal,* 'England expects every man to do his duty.' As long as he had a deck under him and a gun to fire he knew that it was his duty to hold the enemy.

(*a*) State briefly in your own words, and without paraphrasing the whole passage, the grounds on which the writer defends Admiral Beatty from the change of unjustifiably risking his small squadron against the whole German fleet.

(*b*) Explain as clearly as you can in reference to the context the portions in italics.

6.   Make very brief sentences to illustrate the meaning and use of the following expressions, adding explanatory notes where necessary :—

(*a*) (i) To dispose of.   (ii) To be disposed to.
(*b*) (i) To invest in.   (ii) To be invested with.
(*c*) (i) To engage in.   (ii) To be engaged to.
(*d*) (i) To confer with.   (ii) To be conferred on.
(*e*) (i) To succeed to.   (ii) To be succeeded by.

THIRD PAPER (ENGLISH COMPOSITION)
[*For Candidates whose mother-tongue is English*],

1. . Write an eassy on ' The force of example.'
2.   Analyse fully in tabular form :—

      .   I closed mine eyelids, lest the gems
Should blind my purpose, for I never saw.
Nor shall see, here or elsewhere, till I die,
Not though I live three lives of mortal men,
So great a miracle as yonder hilt.

3.   Correct or amend the following, giving reasons in each case :—

(*a*) The   suggestion has   certainly much to recommend in it.

(*b*) It is unfair to argue like you do.   ·   .   ·

(c) Walking across the playground my hat was knocked off by a cricket ball.

(d) Do you remember my cousin whom we thought had settled in Australia? There is some talk of him coming back.

4. Give one example of each of the following:—

(a) An infinitive used absolutely;
(b) 'But' as a relative pronoun;
(c) The definite article used as an adverb;
(d) A verbal noun in the objective case.

5. Report the following conversation between Mr. Rochester and Jane Eyre in the Indirect form, as a by-stander would report it to a friend:—

Mr. R. ' Resume your seat and answer my questions. I perceive these pictures were done by one hand. Was that hand yours? '

J. E. ' Yes '

Mr. R. 'And when did you find time to do them?'

J. E. 'I did them in the last two vacations.'

Mr. R. ' Where did you get your copies?

J. E. 'Out of my head.'

M. R. 'That head I see now on your shoulders?"

J. E. 'Yes, sir.'

Mr. R. 'Has it other furniture of the same kind within'?

J. E. ' I should think it may have. I should hope—better.'

6. Punctuate :—

Johnson who as has been already mentioned though slightingly of Sheridan's art upon hearing that he was also pensioned exclaimed what have they given him a pension.

THIRD PAPER (URDU)

[N. B.—*Name the vernacular from which your translation is made.*]

1. Translate into English :—

ایک مرتبہ ایک شیر ببر نے اپنے سلطنت کے سب جانوروں کو حکم دیا
کہ تم سب اپنی اپنی شوق کی چیز میرے پاس اے آؤ پس ایک روز
جے سب تخت شاہی کے سامنے جمع ہوئے اور بادشاہ کو قسم قسم کی
چیزیں نذر کیا ۔ ہاتھی ایک ڈھیر لذیذ میوہ کا لے آیا ۔ ریچھ تھوڑا سا
شہد لے آیا ۔ گلہری تھوڑے سے اخروٹ لے آئی ۔ غرضکہ تمام جانور سوائے
لومڑی کے تھوڑے نہ تھوڑے لے آئے اور شیر کے قدموں پر رکھدیا ۔ جانوروں
کے بادشاہ نے تب لومڑی کو اشارہ سے بلایا ۔ لومڑی بڑی ناز سے آگے بڑھی
اور بادشاہ عالی کے سامنے سجدہ کیا بادشاہ نے گرجتے ہوئے پوچھا کہ
کیوں بدمعاش تو کیا لایا ہے ۔ لومڑی نے جواب دیا کہ میں اپنے آپ کو
لایا ہوں آپ نے حکم دیا تھا کہ ہم لوگ اپنی اپنی شوق کی چیز
لاؤیں اور میری عرض یہ ہے کہ میری سب سے زیادہ شوق کی چیز میں
ہی ہوں ۔ اس قصہ سے نتیجہ پایا جاتا ہے کہ قریب قریب ہم
سبھوں میں خودی کا مادہ اعلیٰ درجہ کی حکومت کرتا ہے حالانکہ ہم
میں بہت کم لومڑی کے طرح اس بات کو قبول کرنے کی ہمت کرسکیں ۔
شاید ہی کوئی عیب خود غرضی سے زیادہ نفرت کے قابل ہو اور بھی عیب
قریب قریب تمام قسم کے بد اخلاقی کے جز میں پایا جاتا ہے ۔ ایک
جرے منصف نے کہا ہے کہ اگر تم خود مصیبت جھیلنا چاہتے ہو اپو

دوسرونکو مصیبت میں ڈالنا چاہتے ہو تو طریقه آسان ہے - صرف
خود غرض بن بیٹھو اور بس ہوگیا - بر خلاف اسکے بیشتری سے یہ
مواد نہیں ہے کہ اپنے طرف کوئی خیال نہ کیا جاوے - ہم لوگونکو اپنے
حق میں ویسا ہی فرض ادا کرنا ہے جیسا کہ دوسرونکے حق میں اور
اکثر موقعوں میں پہلے معامله کی نسبت غفلت کرنا اسقدر گناه ہے جسے
قدر کہ دوسرے کے نسبت ہملوگونکو جسم اور دل اور روح عطا کیے
گئے ہیں اس غرض سے کہ ہم اُن سے پورا فائدہ اُٹھائیں - اور یہ کام
بغیر فکر اور محنت کے نہیں ہوسکتا اس سلسله میں ہمکو ایک جاپانی
مثله یاد رکھنا اچھا ہے جسکا مطلب یہ ہے کہ حد سے زیادہ اخلاق
بداخلاقی کے برابر ہوتا *

2. Give a description of the celebration of
any one of the greater festivals.

[*Your composition should cover from* FOUR
to SIX *pages of your answer-book.*]

THIRD PAPER (HINDI) ·

[N. B. *Name the vernacular from which your
translation is made.*]

1. Translate into English:

किसी समय में एक सिंह ने अपने इलाके के सब जन्तुओं को आज्ञा
दिया कि वे अपनी सब से अधिक पसन्द की वस्तु लेकर आयें । इसके
अनुसार एक दिन वे सब राजसिंहासन के सामने इकट्ठे हुए और राजा
को नाना प्रकार की वस्तुएँ अर्पण की । हाथी स्वादिष्ट फलों का ढेर
खाया, भालू थोड़ा मधु लाया, गिलहरी अखरोट लाई । वस्तुतः लोमड़ी
को छोड़कर सब जन्तुओं ने कोई न कोई वस्तु लाकर सिंह के पैरों पर
अर्पित किया । इस पर मृगराज ने लोमड़ी को इशारा कर बुलाया ।

लोमड़ी सुकुमार भाव से आगे आई और प्रतापशाली राजा को साष्टांग
प्रणाम किया । राजा ने गरज कर कहा—' क्योंरी धूर्त तू क्या लाई ?
लोमड़ी ने उत्तर दिया—"मैं अपने को लाई हूं । आपने आज्ञा की थी
कि जो वस्तु सब से अधिक पसन्द हो सो लाऊं । मैं सविनय निवेदन
करती हूं कि मुझे सब से अधिक अपना आप ही पसन्द है ।"

इस कहानी का स्पष्ट तात्पर्य यही है कि हम में से चहुतेरों को
सब से अधिक ध्यान अपने आप ही का रहा करता है । यद्यपि हम में
से कुछ ही लोग ऐसे हैं जो लोमड़ी की तरह इस बात को स्वीकार
करने का साहस कर सकें । स्वार्थ परायणता से अधिक गर्हणीय दोष
प्राय ही कोई है । यही सब प्रकार की अशिष्टता की मूल है । एक बड़े
ग्रन्थकार ने कहा है—"यदि तुम अपने को तथा औरों को दुखी करना
चाहो तो उपाय चहुत सहज है ।। स्वार्थपरायण बन चैठो—बस हो
गया ।" परन्तु स्वार्थशून्यता का भी यह अर्थ नहीं है कि अपना कुछ
ध्यान ही न रक्खा जाय । जैसे दूसरों के अर्थ वैसे ही अपने अर्थ भी हम
को कर्तव्यपालन करना है । और प्राय: जैसे एक की वैसे ही दूसरे को
भी उपेक्षा करना अनुचित है । हमारे आत्मा मन तथा शरीर हैं । ये हमको
यथासाध्य उपयोग के लिए दिए गये हैं । और यह विना चिन्ता तथा
श्रायास के नहीं हो सकता । इस प्रसङ्ग में यदि हम एक जापानी कहा-
वत स्मरण रक्खें तो अच्छा हो—" अति आदर अनादर ही है ।"

   2. Give a description of the celebration of
any one of the greater festivals.

[*Your composition should cover from* FOUR
to SIX *pages of your answer-book*].

———

Intermediate Examination Papers, 1918

ENGLISH

1. [*The answers to this question should not occupy more than three pages of your answer-book.*]

Either,

(*a*) Write a brief account in your own words of the death of Socrates.

Or,

(*b*) Describe the scene in the castle hall at Schonwaldt after its capture by De la Marck.

2. Explain, with reference to the context, *any five* of the following :—

(*a*) "I thank you, kind master, for your information," said the Scot ; ' but my stay will be so short here that if I fail not in a morsel of meat and a drink something better than water, my necessities at Phessis, be it of the park or pool, will be amply satisfied."

(*b*) " You did well, Count de Crevecœur," said Louis scornfully, " to begin your embassy at an early hour ; for if it be your purpose to call on me to account for the flight of every vassal whom your master's heady passion may have driven from his dominions, the bead-roll may last till sunset."

(*c*) Crawford pressed forward into the circle dragging le Balafre after him, who, awkward and

, bashful, followed like an unwilling mastiff toward on in leash, as his leader exclaimed.—" Away with your hoofs and hides, and painted iron ! No one, save he who slew the boar, can show the tusks ! "

(d) " And why will I do none of these things ? It is not from arrogance, Athenians, nor because I hold you cheap ; whether or no I can face death bravely is another question ; but for my own credit and for your credit, and for the credit of the city, I do not think it well at my age, and with my name, to do anything of the kind.

(e) But if death is a journey to another place, and the common belief be true, that there are all who have died, what good could be greater than this my, judges ? Would a journey not be worth taking ?

(f) Know well, my dear friend, that this is what I seem to hear, as the worshippers of Cybele seem, in their frenzy, to bear the music of flutes ; and the sound of these words rings loudly in my ears, and drowns all other sounds.

(g) " Whilst we lived together nothing could sever our companies : but now at our death, I fear me they will make us change our countries. For, as thou, being a Roman, hast been buried in Egypt : even so, wretched creature I, being an Egyptian, shall be buried in Italy, which shall be all the good that I have received by thy country."

(h) Others make a vanity of telling their faults; they are the strangest men in the world; they can-

not dissemble ; they own it is a folly ; they have
lost abundance of advantages by it ; but, if you
would give them the world, they cannot help it ;
there is something in their nature that abhors
insincerity and constraint.

(*i*) " I sat and wept in secret the tears that
men have ever given to the memory of those that
died before the dawn, and by the treachery of
earth, our mother. But suddenly the tears and
funeral bells were hushed by a shout as of many
nations, and by a roar as from some great king's
artillery, advancing rapidly along the valleys and
heard afar by echoes from the mountain. "

3. Explain in your own words the meanings
of the phrases in italics of either (not both) of
the following passages :—

(*a*) Before this parliament *his condition of life
was so happy that it was hardly capable of im-
provement.* Before he came to be twenty years of
age, he was master of a noble fortune, which
descended to him by the gift of a grandfather.
without passing through his father or mother,
who were then both alive, and *not well enough
contented to find themselves passed by in the des-
cent.* His education for some years had been in
Ireland, where his father was Lord Deputy, so
that when he returned into England to the posses-
sion of his fortune. he was unentangled with
any acquaintance or friends, which *usually grow
up by the custom of conversation* ; and therefore
was to make a pure election of his company,

which he choose by other rules than were pre-
scribed to the young nobility of that time. And it
cannot be denied, though he admitted some few to
his friendship for the agreeableness of their na-
tures, and their undoubted affection to him, that
his familiarity and friendship for the most part was
with men of the most eminent and sublime parts
and of untouched reputation in point of integrity :
and *such has a title to his bosom.*

Or,

(b`   It is always obesrvable *that silence pro-
pagates itself,* and that the longer talk has been
suspended, the more dificult it is to find anything
to say.   We began now to wish for conversation ;
but *no one seemed inclined to descend from his
dignity,* or first to propose a topic of discourse.
At last a corpulent gentleman, *who had equipped
himself for this expedition with a scarlet surtout*
and a large hat with a broad lace drew out his
watch and then held it dangling at his finger.
This was, I suppose, understood by all the compa-
ny as an invitation to ask the time of the day, but
nobody appeared to heed his overture ; and his
desire to be talking so far overcame his resent-
ment that he let us know of his own accord that it
was past five. and that in two hours we should be
at breakfast. *His condescension was thrown away.*

4.   Turn the following passage into the Indi-
rect form of speech :—

He then addressed himself to Davies, '' What do
you think of Garrick ? He has refused me an order

for the play for Miss Williams, because he knows
the house will be full, and that an order would be
worth three shillings.   Eager to take any opening
to get into conversation with him, I ventured to
say, " O, Sir. I cannot think Mr. Garrick would
grudge such a trifle to you. "

5.   *If we consider our *own country in its
natural prospect without any of the benefits and
advantages of commerce *what a barren and un-
comfortable spot of earth falls to our share ! Na-
tural historians tell us that no fruit grows originally
among us, besides hips and haws. acorns and pig-
nuts, with other delicacies of the like nature ; that
our climate of itself *without the assistance of art,
can *make no further. advances towards a plum
than to a sloe.

   (a) Give a clause analysis of the above.

   (b, Parse the words preceded by an asterisk.

SECOND PAPER

*[Marks will be deducted for illegible writing
and bad composition.]*

1.   Re-write any *two* of the following passa-
ges in clear and simple prose :—

   (a)   Vainly to each holy shrine,
         In mutual pilgrimage, they drew;
      Implored, in vain, the grace divine
       For chiefs, their own red falchions slew ;
      While Cessford owns the rule of Carr,
         While Ettrick boasts the line of Scott,

The slaughter'd chiefs, the mortal jar,
> The havoc of the feudal war,   I
Small never, never be forgot !

(b) Marauding chief ! his sole delight
The moonlight raid, the morning fight ;
Not even the Flower of Yarrow's charms
In youth, might tame his rage for arms ;
And still, in age, he spurn'd at rest,
And still his brows the helmet press'd,
Albeit the blanched locks below
Were white as Dinlay's spotless snow.

(c) Not that, in sooth, o'er mortal urn
Those things inanimate can mourn ;
But that the stream the wood, the gale,
Is vocal with the plaintive wail
Of these, who else, forgotten long,
Lived in the poet's faithful song,
And, with the poet's parting breath,
Whose memory feels a second death.

2. Give the context of the following passages
and explain them, showing why the adjectives
printed in italics have been chosen :—

(i) Soon cross'd the *sounding* barbican.

(ii) Each wave was crested with *tawny* foam.

(iii) They gleam'd on many a busky tarn,
Haunted by the *lonely* earn.

(iv) Some drove the *jolly* bowl about.

(v) Caledonia's ' *rugged* strand, '

3. Explain, with reference to the context the meaning of any *three* of the following :—

> (a) Full fain was he when the dawn of day
> Began to brighten Cheviot grey ;
> He joy'd to see the cheerful light,
> And he said Ave Mary, as well as he might.

> (b) Word on word gave fuel to fire,
> Till so highly blazed the Beattison's ire,
> But that the Earl the flight had ta'en,
> The vassals there their lord had slain.

> (c) In all the northern countries here,
> Whose word is snaffle, spur, and spear,
> Thou wert the best to follow gear !

> (d) Then, to his knee sly creeping on,
> With bodkin pierced him to the bone :
> The venom'd wound, and festering joint,
> Long after rued that bodkin's point.

4. An island state has some priceless advantages. *Her frontiers are fixed by nature beyond all possibility of question ;* there can be no disputes with neighbours arising from encroachments on the common frontier ; there can be no temptation on either side to aggression for the sake of obtaining a coveted bit of territory. But an insular nation, when making a military attack on another state, *has obviously to face the same difficulties which are involved in the invasion of an island* and is therefore altogether *dependant on naval strength for effective aggression.*

> (i) Explain in your own words, with refer-
> ence to the context, the meaning of the

portions of the above passage printed
in italics.

(ii) Why, according to the writer of the
above passage, are nations likely to
quarrel if their territories are adjoin-
ing ?

5 Summarise in simple English, in your own
words, the meaning of the following passage:—

Columbus was fully sensible of his perilous
situation. He had observed with great uneasiness
the fatal operation of ignorance and of fear in
producing disaffection among his crew, and saw
that it was now ready to burst' out into open
mutiny. He retained however, perfect presence of
mind. He affected to seem ignorant of their
machinations. Notwithstanding the agitation and
solicitude of his own mind he appeared with a
cheerful countenance, like a man satisfied with the
progress he had made. and confident of success.
Sometimes he endeavoured to work upon the ambi-
tion or avarice of his men by magnificent
descriptions of the fame and wealth which they
were about to acquire. On other occasions he
assumed a tone of authority, and threatened them
with vengeance from their sovereign, if, by their
dastardly behaviour, they should defeat this noble
effort to exalt the Spanish name above that of
every other nation.

6. Observing that, though their jaws were so
terrible; yet the animals being *mighty* slow in work-
ing themselves *round*, he had nothing to do but

place himself exactly opposite to their middle and as close to them as possible, he despatched them with his hatchet at *will*.

  (*a*) Give a clause analysis of the above passage.

  (*b*)   Parse the words printed in italics.

THIRD PAPER (ENGLISH COMPOSITION)

(For candidates whose mother-tongue is English)

1.   Write an essay on ' India and the World-war' showing how this country is being affected by the great struggle.

2. (*a*) Give a clause analysis only of the following passage. ''This I know full well, that, as sure* as man is mortal and to err is human, justice deferred* enhances the price at which you must purchase safety and peace ; nor can you expect to gather in another crop* than they did who went before you, if you persevere* in their utterly abominable husbandry of sowing injustice and reaping* rebellion.

  (*b*) Parse the words followed by an asterisk.

3.   Distinguish between ' few ' and ' a few,' ' beside ' and ' besides,' ' latest ' and ' last ' illustrating your answer by sentences exemplifying their use.

4.   Criticise the following sentences and correct them :—

  (*a*) There came a dimness over my eyes that I could not see.

(b) By waiting tell then I will be sure to be
     right
(c) It is vain raving against the system.
(d) I need hardly say my remarks were not
     directed at him personally but at his
     article on cricket.

5. Punctuate : Sir said don quixote making
him rise is it then possible that my history is
extant and that it was a moor that penned it is
so notorious a truth said the bachelor that I do
not doubt but at this day there have been pub-
lished above twelve thousand copies of it portugal
barcelona and valencia can witness that if there
were occasion it is said that it is also now in the
press at antwerp.

THIRD PAPER (URDU)

[N B.—*Name the vernacular from which your
translation is made.*]

1. Translate into English :—

(a) آشوک نے انتالیس برس سلطنت کرنیکے بعد دوسو تیئیس
(۲۲۳) برس مسیح سے پہلے وفات پائی ۔ اوس میں اپنی عظیم سلطنت
کو قابو میں رکھنے کی طاقت تھی ۔ اور سرحدی خود مختار ریاستوں سے
وہ دوستانہ تعلق قائم کئے ہوئے تھا ۔ یہی وجہ تھی کہ اوسکے طویل عہد
سلطنت میں ہندوستان کو جیسا امن و امان کا زمانہ ملا ویسا بہت
کمتر اوسکی تاریخ میں پایا جاتا ہے ۔ 'اعظم ' نہلانے کا ایسا استحقاق
بہت ہی کم بادشاہوں کو اس مستقل مزاج اور اعلی ظرف بادشاہ نے
مارے حاصل ہے اور نہ کسیکا اسقدر اثر انسانوں پر اونکی بہبودی کے لئے
تھا ٭

(b) تحقیقات کا نتیجہ اس معاملے میں بہت اختلاف رائے ظاہر
کرتا ہے کہ مدرسے کی تعلیم کی مختلف منزلوں میں طالب علم سے گہریز
چاہئے اوتنا غور نہیں کیا گیا اور جرتیکہ گھر پر کام دینے کے طریقے کا
نامناسب عمل مستقل طور سے جسمانی اور دماغی نقصان پہونچا سکتا ہے
میں لائی جائیں * لہذا لازم ہے کہ طالب علمون کو اس سے بچانے کے لیۓ تدبیریں عمل

2. Give a description of the most interesting
game you have seen or taken part in as a player.

Or,

Give a descriptive account of the death of
Socrates.

THIRD PAPER (HINDI)

(Your composition should cover from FOUR to
SIX pages of your answer-book).

[N. B.—Name the vernacular from which your
translation is made.]

1. Translate into English :—

(a) अशोक एकतालीस वरस राज करके २२३ ई०
पूर्व में मर गया । वसमें अपने विशाल साम्राज्य के पूरे विस्तार की
दबाने की शक्ति थी घोर सिवाने पर जो स्वाधीन राज्य थे वसके साथ
मित्रता का व्यवहार भी उसने स्थिर रक्खा था । इसी लिये वसके लंबे
राज्यशासन काल में हिन्दुस्तान को सर्वत्र शान्ति का सुख मिला
जैसा उसके इतिहास में बहुत कम रहा है । बहुत थोड़े ही राजाओं
ती महान् शब्द की पदवी की ऐसी योग्यता हुई है ।

सङ्कल्प और उदारचित्त राजा की थी और न किसी का मनुष्य-
जाति पर उनके कल्याण के लिये ऐसा प्रभाव है ।

(b) जितनी जांच पड़ताल हुई उसका फल इस विषय में बड़ा
मतभेद ही निकला कि पाठशाला के पाठक्रम की भिन्न भिन्न अवस्था
में छात्रों से घर पर कितना काम उचित, रीति से कराया जाय ।
प्रगट है कि इस विषय पर जितना चाहिये उतना ध्यान नहीं
दिया गया और घर में पाठ का काम देने की रीति का अनुचित
प्रयोग शारीरिक और मानसिक दोनों असाध्य हानियां कर सकता
है इस लिये यह आवश्यक है कि इससे छात्रों की रचा का उपाय
किया जाय ।

2. Give a description of the most interesting
game you have seen or taken part in as a player.

<p align="center">Or,</p>

Give a descriptive account of the death of
Socrates.

(Your composition should cover from FOUR to
SIX pages of your answer-book).

Intermediate Examination Papers, 1919

ENGLISH

FIRST PAPER

*N.B.—Marks will be deducted for illegible writing
and for bad composition.*

1. [*The answer to this question should not
occupy more than three pages of your answer book.*]

Either,

(*a*) Illustrate the Socratic method of questioning by reproducing in the form of a dialogue the substance of the reasoning by which Socrates convinced Crito that " we must not think so much of what the many will say of us ; we must think of what the one man, who understands right and wrong, and of what Truth herself will say of us."

Or,

(*b*) Contrast the character of King Louis with that of Charles of Burgundy, supporting your statements by referring to incidents in *Quentin Durward.*

2. Explain with reference to the context the meaning of any *five* of the following :—

(*i*) " And in the Comedy of Aristophanes you yourselves saw a man called Socrates swinging round in a basket, and saying that he walked the air, and talking a great deal of nonsense about matters of which I understand nothing either more or less."

(*ii*) " For yourself, you might go to one of the neighbouring cities, to Thebes or to Megara for instance — for both of them are well governed — but, Socrates, you will come as an enemy to these commonwealths ; and all who care for their city will look askance at you, and think that you are a subverter of law."

(*iii*) " Martivalle was none of those ascetic, withered pale professors of mystic learning of those days, who bleared their eyes over the midnight furnace, and macerated their bodies by outwatching the polar bear."

(*iv*) " Yet, strong in passive courage, like most of his tribe, his eye, while it glistened and wandered, as well as the contorted smile of his mouth, seemed to bid defiance to the death he was about to die."

(*v*) " For natural abilities are like natural plants, that need pruning by study ; and studies themselves do give forth direction too much at large, except they be bounded by experience."

(*vi*) " Sunday clears away the rust of the whole week, not only as it refreshes in their minds the notions of religion, but as it puts both the sexes upon appearing in their most agreeable forms, and exerting all such qualities as are apt to give them a figure in the eye of the village."

(*vii*) " For as it is the chief concern of wise men to retrench the evils of life by the reasonings of philosophy it is the employment of fools to multiply them by the sentiments of superstition."

(*viii*) " '*Be a good man, my dear.*' One can't but think of these last words of the veteran Chief of Letters, who had tasted and tested the value of worldly success, admiration, prosperity. Was Irving not good, and, of his works, was not his life the best part ?"

3. Explain in your own words the meanings of the phrases in italics of either (nor both) of the following passages :

(*a*) There is scarcely a village in Europe, and not one university, that is not thus *furnished its little great men. The head of a petty corporation*, who opposes the designs of a prince who would tyranically force his subjects to their best clothes for Sundays—*the puny pedant who finds one undiscovered property in the polype*, describes and unheeded process in the skeleton of a mole, and *whose mind, like his microscope, perceives mature only in detail*—the rhymer who makes smooth verses, and *points to our imagination when he should only speak to our hearts,*— all equally *fancy themselves walking forward to immortality*, and desire the crowd behind them to look on. *The crowd takes them at their word.* Patriot philosopher, and poet are shouted in their train. Where was there ever so much merit seen ? no times so important as our own ! ages yet unborn shall gaze with wonder and applause ! *To such music the important pigmy moves forward,* bustling and swelling, and aptly compared to *a puddle in a storm.*

(*b*) Notwithstanding the frostiness of the morning the sun in his cloudless journey had acquired sufficient power to melt away the thin covering of snow from *every southern declivity*, and *to bring out the living green* which adorns an English landscape even in midwinter. *Large tracts of smiling verdure contrasted with the dazzling whiteness of the shaded slopes* and hollows. *Every sheltered bank, on which the broad rays rested, yielded its silwer rill of cold and limpid water*, glittering through the dripping grass ; and *sent up slight exhalations to contribute to the thin haze* that hung just above the surface of the earth. There was something truly cheering in *this triumph of warmth and verdure over the frosty thraldom of winter* ; it was, as the squire observed, *an emblem of Christmas hospitality, breaking through the chills of ceremony and selfishness*, and thawing every heart into a glow.

4. Do you mean to say that you who are so much younger than* I, are yet so much wiser* than I; that you know that bad citizens always do evil, and that good citizens always do good, to those with whom they come in contact, while I am so extraordinarily stupid as not to know* that if I make any of my companions a rogue , he will probably injure me in some way ?

(*i*) Give a clause analysis of the above passage,

N.B—Write out the clauses fully ; words should not be represented by dots.

(*ii*) Parse the words marked with an asterisk.

5. " I am a servant of King Louis of France,"
said Quentin boldly : " an archer of the Scottish
Guard, as my language and dress may partly tell
you. The hosts of Charles of Burgundy will be
instantly in motion against you all ; and if you
wish assistance from France, you must conduct
yourselves in a different manner.

Turn the above passage into indirect speech as
reported by one of William de la Marck's followers.

SECOND PAPER

N.B.—Marks will be deducted for illegible writing
and for bad composition

1. Re-write the following passages in clear and
simple prose :—

> (*a*) Soon on the hill's steep verge he stood
> That looks o'er Branksome's towers
> and wood ;
> And martial murmurs from below
> Proclaimed the approaching southern foe.
> Through the dark wood, in mingled tone,
> Were Border-pipes and bugles blown ;
> The coursers' neighing he could ken,
> And measured tread of marching men ;
> While broke at times the solemn hum,
> The Almayn's sullen kettle-drum,

> The evening fell,
> (*b*) 'Twas near the time of curfew-bell ; .
> The air was mild. the wind was calm,

> The stream was smooth, the dew balm ;
> E'en the rude watchmen on the tower
> Enjoyed and blessed the lonely hour.
> Far more fair Margaret loved and blessed
> The hour of silence and of rest.
> On the high turret, sitting lone,
> She waked at times the lute's soft tone.

2. Explain, with reference to the context, any *three* of the following passages :—

(*a*) " Letter or line know I never a one,
  Wer't my neck-verse at Hairibee."

(*b*) When first the Scott and Car were foes,
  When Royal James beheld the fray,
  Prize to the victor of the day.

(*e*) On the drawbridge the warders stout
  Saw a terrier and lurcher passing out.

(*d*) Each better knee was bared, to aid
  The warriors in the escalade.

(*e*) Kings of the main, their leaders brave,
  Their barks the dragons of the wave.

3. Describe briefly what took place when Deloraine visited Melrose Abbey. Why did he pay his visit at night ?

4. (*a*) Give, very briefly, the meaning of the following passage in your own words :—

" There is one boon which would be eagerly welcomed, and that is an easy and effective safeguard against the ravages of plague. The sanitary authorities are indeed *well on the track of this disease*, and they have now reached a point where

prediction is possible; they have told us, for in-stance, that India is probably *in for a bad season*, and that if the last month has been damp in the northern provinces, we must be prepared for *heavy mortality* in the spring. It is something to be fore-warned, but there is *still a long way to go* before the disease brought under effective control, and the people must learn to help themselves, if *the lessons of science are to be turned to good account.*

(*b*) Explain the passages in the above which are printed in italics.

5. Give a clause analysis of the following sentence and parse the words in italics.

" *What* seems *most* extraordinary in the battle, is that the event *should have been for* a moment *doubtful*."

6. Convert the following into Indirect Speech :—

[N.B.—The person addressed is a woman.]

" I hope you wont mind," he went on, a little taken aback. " You ought not. I have turned it all over, and upon my soul there's nothing in it. We should never be one whit nearer than we are just now, and, if I am a wise man, nothing like so happy."

THIRD PAPER.

For Condidates whose mother-tongue is English.

1. Write an essay on " The Value of Cor-porate College Life."

2. (*a*) Give a clause analysis only of the following passage :—But* by pursuing closely one* argument which is not cloyed* with many turns, the French have gained more liberty for verse in which they write : they have leisure to dwell upon a subject which deserves it, and to represent the passions* (which we have acknowledged to be the poet's work) without being* hurried from one thing to another, as* we are in the plays of Calderon, which we have seen lately upon our theatres, under the name of Spanish plots.

(*b*) Parse the words followed by an asterisk.

3. Criticise the following sentences and correct them :—

(*a*) I had several students died in my hostel of cholera.

(*b*) All who profess to be brave are not so.

(*c*) The man glorified in his undertaking.

(*d*) All praise to them whom rule their lives aright.

4. What do you understand by good "style" in composition ?

5. Write notes on :—Rhythm, a Foot, Caesura Middle Rhyme.

6. Punctuate :— what does a stitch in time saves nine mean buster asked the child as her guide philosopher and friend entered the club in search of tea ere bearing his modest part in a literary session of the same daddy said it about his saddle.

THIRD PAPER (URDU)

[N.B.—*Name the vernacular from which your translation is made.*]

1.   Translate into English :—

A

جب کیپ کالونی (Cape Colony) کا پہلے پہل پتا لگا تو اُس
میں کئی طرح کے جنگلی جانور بہرے بڑے تھے ۔ لیکن گورے لوگوں کے
آنے اور اُن کے خطا نکرنے والے ہتھیاروں سے بہتیرے جانور غائب ہوگئے ۔
شتر مرغ کا تو خاص کرکے کال ہی آگیا تھا کہ اون کے ساتھ اچھی بڑتاؤ
کا طریقہ نکالا گیا ان چڑیوں کی ایک تجارتی قیمت ہے ۔ ان کے پروں
کی ما نگ بڑھتی جاتی ہے ۔ اس سے ان کو مارنے کے بدلے بچانا چاہئے ۔
یہ طریقہ مان لیا گیا ۔ پس شتر مرغوں کے پالنے کے باڑے بنے ۔ یہ
باڑے بڑے اور بے تعمنگے ہیں لیکن کم چلاؤ ہیں ۔ ریتیلے اوسر اور
چھوٹی چھوٹی جھاڑیوں نٹیلے (خاردار) تاروں سے گھیر دیا ہے اور
انہیں گھیروں میں یہ پرندے اپنے پروں کے لئے پالے جاتے ہیں ۔

B

وکٹوریہ نائنزا (Victoria Nyanza) تقریباً ۳٬۰۰۰ فٹ سطحِ
سمندر سے اونچی ہے ۔ اس کے چاروں طرف کا ملک پٹھاروں
(plateaux) کی زمین ہے جس میں اچھی چرائی کے تھیت مستنئی
ملتانے والی ہوا اور چکنی پہاڑیاں ہیں جن میں جا بجا کیلے کے باغ
لگے ہیں اور جنگل بیچ بیچ میں گہنی درختوں کی کھائیاں یا گیلی زمین
کے جنگل ہیں ۔ اور ان کو چیر کر جانا گہنی جنگلاروں میں ہوکر جانا
بھی مشکل ہے ۔ یہاں بڑے بڑے گھاس کے بھی میدان جن میں پانی
اور اکثر بھی بہت ہے اور اِنہی زمینہ سے یہ غوبشئوں کے پالنے یا

بوٹروں کے گلے رکھنے کے لئے نہایت ہی مناسب ہیں اس ملک میں
بہت پانی برستا ہے ۔ اور بادل کی گرج اور بجلی کی چمک بھی بہت
ہوا کرتی ہے *

2. Write an Essay on *one* of the following subjects :—

(Your essay should cover from four to six pages of your answer-book.

What would you do if you were given Rs. 15,000 to spend in any way you liked ?

<div align="center">Or,</div>

Describe some interesting Railway journey you have taken.

Third Paper (HINDI)

[N. B.—*Name the vernacular from which your translation is made.*]

1. Translate into English :—

<div align="center">A</div>

जब केप कालोनी (Cape Colony) का पहिले पहिल पता लगा तो इसमें कई तरह के जंगली जानवर भरे पड़े थे। पर गोरे लोगों के और उनके न चूकने वाले हथियारों के आते ही बहुतेरे जानवर विच्छिन्न हो गये। शुतुमुर्गें का विशेष कर काल ही आ गया था कि उनके साथ अच्छे बर्ताव की रीति निकाली गई। इन पखेरुओं का एक व्यापारिक मूल्य है। इनके पंखों की मांग बढ़ती जा रही है इससे इनको मारने के बदले बचाना चाहिये। यह रीति मान ली गई

और शुतुमुर्गों के पालने को वाड़े बने—ये वाड़े बड़े और विहंगे हैं तब भी काम चलाऊ हैं । रेतीले ऊसर और छोटी छोटी झाड़ियों को कटीले तारों से घेर दिया है और इन्हीं घेरों में पक्षेरू अपने पंखों के लिये पाले जाते हैं ।

B

विक्टोरिया नयान्ज़ा (Victoria Nyanza) समुद्रतल से लगभग ४,००० फुट ऊँची है । इसके चारों ओर का देश पठारों (plateaux) की भूमि है जिसमें अच्छे चराई के खेत, सुस्ती मिटाने वाली हवा, चिकनी पहाड़ियां हैं; जिन पर कहीं कहीं केले के बाग लगे हैं और जिनके बीच बीच में घने पेड़ों की घाटियां या गीली धरती के जंगल हैं और इनको चीर कर पार करना घने वनों में होकर जाने से भी कठिन है । यहां बड़े बड़े घास के भी मैदान हैं, जिनमें पानी और लकड़ी भी बहुत है । और इसी से ये ढोर पालने वा भेड़ों के गल्ले रखने के अत्यन्त योग्य हैं । इस देश में बहुत पानी बरसता है और वादल की गरज और विजुली की चमक भी बहुत हुआ करती है ।

2. Write an Essay on *one* of the following subjects :—

(Your essay should cover from four to six pages of your answer-book).

What would you do if you were given Rs. 15,000 to spend in any way you liked ?

Or;

Describe some interesting Railway journey you have taken.

Intermediate Examination Papers, 1920

ENGLISH ·

FIRST PAPER

Time—Three hours

N.B.—*Marks will be deducted for illegible writing and for bad composition.*

1. [*The answer to this question should not occupy more than three pages of your answer book.*]

Either,

(*a*) Write a brief account in your own words of the life led by English Country Gentlemen in 1685

Or.

(*b*) Describe the character of Sir Roger de Coverley, illustrating his peculiarities from incidents related in the essays you have read.

2. Explain with reference to the context the meaning of any *five* of the following:—

(i) Whoever examines the maps of London which were published towards the close of the reign of Charles the Second will see that only the nucleus of the present capital then existed The town did not as now fade by imperceptible degrees into the country.

(ii) The more carefully we examine the history of the past, the more reason shall we find to dissent from those who imagine that our age has been fruitful of new social evils. The truth

is that the evils are, with scarcely an exception, old.   That which is new is the intelligence which discerns, and the humanity which remedies them.

(iii) " I would have known thee boy, in the landes of Brodeaux, had I met thee marching there like a crane on a pair of stilts. But come —come, unbuckle your Scottish mail-bag—give us the news of Glen Houlakin."

(iv) " Nay, then, sir," said Rouslaer, since you stand so much on your incognito, and with us, too, who are men of confidence, let us ask you roundly, wherefore wear you the badge of your Company if you would remain unkown in Liege?"

(v) " Methinks, fair mistress, in this account of your wanderings, you have forgot all mention of certain love passages. Tell me, King Louis, were it not well, before this vagrant Helen of Troy, or of Croye, set more kings by the ears— were it not well to carve out a fitting match for her ?"

(vi) The necessities of hunger and thirst were his greatest diversions from the reflections on his lonely condition. When those appetites were satisfied the desire of society was as strong a call on him, and he appeared to himself least necessitous when he wanted everything.

(vii) The young fellow who I found was very extravagant, gave great demonstrations of joy at the receiving of the will : but opening it, he found himself disinherited and cut off from the posssesion of a fair estate, by virtue, of my being made a present to him.

(viii) God bless him indeed ! For the term of his twilight diligence is near as hand : and for not much longer shall we watch him speeding up the street and, at measured intervals, knocking another luminous hole into the dusk.

    3. Explain in your own words the meanings of the phrases italicised in either (not both) of the following passages :—

    (*a*) Perhaps there is no part of a painter's life (if we must tell ' *the secrets of the prison house*') in which he has more enjoyment of himself and his art, than that in which, after his work is over, and *with furtive, sidelong glances* at what he has done, he is employed in washing his brushes and cleaning his pallet *for the day*. Afterwards, when he gets a servant in livery to do this for him, he may have *other and more ostensible sources of satisfaction*—greater splendour, wealth or fame ; but he will not be so wholly *in his art*, nor will his art have such a hold on him as when he was too poor to transfer *its meanest drudgery* to others—too humble to despise aught that had to do with the object of his glory and his pride, with that on which all his projects of ambition or pleasure were founded. ' *Entire affection scorneth nicer hands*.' When the professor is above this mechanical part of his business, it may have become *a stalking horse to other worldly schemes*, but it is no longer his *hobby horse* and the delight of his inmost thoughts.

<div align="center">

Or,

</div>

    (*b*) Why, a man's books may not always speak the truth, but *they speak his mind in spite of him*

self : and it seems to me *this man's heart is beating through every page* he penned. He is always *in a storm of revolt* and indignation against wrong, craft, tyranny. How he cheers heroic resistance ; how *he backs* and applauds freedom *struggling for its own* ; how he hates scoundrels, ever so victorious and successful ; how he recognises genius, though selfish villains possess it ! The critic who says Macaulay had no heart, might say that Johnson had none ; and two men more generous, and *more loving and more hating* , and more *partial* and more noble, do not live in our history. Those who knew Lord Macaulay knew how admirably tender and generous and affectionate he was. *It was not his business to bring his family before the theatre footlights, and call for bouquets from the gallery while he wept over them.*

4. " I will convey Your Majesty's answer to my most gracious master : yet, let me say, that, as it is degree different from the evasive replies, which have already been returned to his just complaints I cannot hope that it will afford the means of re-establishing peace and friendship betwixt France and Burgundy. " Turn the above passage into Indirect Speech.

5. To enhance* his surprise, his companion told him that the environs of the castle, except the single winding path by which the portal might be safely approached, were, like* the thickets through which they had passed, surrounded with every species of hidden pitfall, snare, and gin, to entrap* the wretch who should venture thither

without a guide ; and that upon the walls were constructed certain cradles* of iron, called "swallows' nests" from which the sentinels who were regularly posted there could, without being exposed to any risk, take deliberate aim at any who should attempt to enter without the proper signal or password of the day.

(i) Give a clause analysis of the above passage.

N.B.—Write out the clauses fully : words should not be presented by dots.

(ii) Parse the words marked with an asterisk.

SECOND PAPER

Time—Three hours.

[N. B.—*Marks will be deducted for illegible writing and for bad composition*].

1. Explain in your own words the meaning of the phrases italicized in *one* (not both) of the following passages :—

Either,

(a)   As nature's ties decay,
As duty, love, and honour fail to sway,
Fictitious bonds, the bonds of wealth
    and law,
Still gather strength, and *force unwilling awe.*
Hence *all obedience bows to these alone,*
And *talent sinks, and merit weeps unknown :*

Till time may come, when, stript of all
    her charms,
The land of scholars and *the nurse of
    arms*,
Where *noble stems transmit the patriot
    flame*,
Where kings have toil'd and poets wrote
    for fame,
One sink of level avarice shall lie,
And scholars, soldiers, kings, unhonour'd
    die.

Or,

(b) Yes ! *let the rich deride, the proud
    disdain,*
    *These simple blessings of the lowly
        train :*
    To me more dear, congenial to my heart,
    One native charm, than all the gloss of
        art:
    *Spontaneous joys, where Nature has its
        play,*
    *The soul adopts, and owns their first
        born sway ;*
    Lightly they frolic o'er the vacant mind,
    Unenvied, unmolested, unconfined.
    But the long pomp. the midnight mas-
        querade.
    With all the freaks of wanton wealth
        array'd,
    In these, *are triflers half their wish
        obtain,*
    The toiling pleasure sickens into pain;

> And *e'en while fashion's brightest arts
>   decay,*
> *The heart distrusting asks if this be joy.*

2. Re-write any *two* of the following passages in clear and simple prose :—

> (i) For who, to dumb Forgetfulness a
>   prey.
>   This pleasing anxious being e'er re-
>   signed
> Left the warm precincts of the cheerful day,
>   Nor cast one longing, lingering look be-
>   hind ?

> (ii) From Art more various are the bless-
>   ings sent ;
>   Wealth, commerce, honour, liberty,
>   content
>   Yet these each other's powers so strong
>   contest.
>   That either seems destructive of the rest.

> (iii) For, as refinement stops, from sire to
>   son
>   Unalter'd, unimprov'd, the manners run,
>   And love's and friendship's finely-
>   pointed dart
>   Fall blunted from each indurated heart.

> (iv) Pleased with his guests the good man
>   learned to glow,
>   And quiet forgot their vices in their
>   woe ;

> Careless their merit or their faults to
>   scan,
> His pity gave ere charity began.

Explain with reference to the context the
meaning of any *three* of the following passages :—

> (i) And though the rocky crested summits
>   frown,
>   These rocks by custom torn to beds of
>   down.

> (ii) Where the bleak Swiss their stormy
>   mansions tread,
>   And force a churlish soil for scanty bread.

> (iii) Low lies that house where nut-brown
>   draughts inspired,
>   Where grey-beard mirth and smiling
>   toil retired.

> (iv) Let not Ambition mock their useful toil,
>   Their homely joys, and destiny obscure.

> (v) But Knowledge to their eyes her ample
>   page,
>   Rich with the spoils of time, did ne'er
>   unroll.

4. Give a clause analysis of the following pass-
age and parse the words in italics :—

[*N. B.—Clauses must be written out in full words
should not be represented by dots.*]

> *Such* are the charms to barren states
>   assign'd ;
> Their wants but few, their wishes all
>   confined :

Yet *let* them only share the praises *due*,
If few their wants, their pleasures
are but few ;
For every want *that* stimulates the breast
Becomes a source of pleasure when redress'd.

5. N. B.—*Parts (a) and (b) of this question are
set for all candidates except those
whose mother-tongue is English.
Parts (c) (d) and (e) are set only for
candidates whose mother-tongue is
English.*

(*a*) *To be answered by all candidates* except
those whose mother-tongue is
English.

Give in your own words the meaning of the
phrases italicized in the following passage :—

When you look along *the gallery of the worlds
great generals*, those who seem *to have bent the
destiny of peoples*, you may sometimes reflect
that in appearance they have *one common charac-
teristic :* they are cold, hard, stern. You may
call it strength, if you please, but it is not quite
that, or not that alone. A strong man may be of
*kindly mien ; a gentleness repressed may peep
for a moment from behind the mask.* In the look
of many of these men *there is a suggestion of
remorselessness.* How could it be otherwise ?
There can be nothing surprising that men whose
business, after all, is bloody destruction, men
who are paid to fight and kill, should have a
heartless glance, *the facial mark of militarism.*

(b) *To be answered by all candidates* except those whose mother-tongue is English.

(a) *Give as briefly as you can* in your own words the meaning of the following passage :—

The British Empire is a trust, a trust to be administered in the interests of the subjects primarily, and secondarily in the interests of the whole civilised world. That this is not the assertion of a boast or of an unrealised ideal but of a fact and a practice is sufficiently demonstrated by two unquestionable facts, which cannot be too often repeated. The first is the fact that the units of this Empire are not only free from all tribute in money or man, but are not even required to make any contribution to the upkeep of the fleet, upon which the safety of all depends. The second is the fact that every port and every market in the vast Empire, so far as they are under the control of the central government, are thrown open as freely to the citizens of all other States as to its own.

(c) *To be answered only by candidates* whose mother-tongue is English.

Explain with reference to the context the meaning of any *four* of the following passages :—

(i) Love looks not with the eyes, but with
        the mind ;
    And therefore is wing'd cupid painted
        blind :
    Nor hath Love's mind of any judgment
        taste ;
    Wings, and no eyes, figure unheedy haste.

(ii) And sometimes lurk I in a gossip's bowl
    In very likeness of a roasted crab,
    And, when she drinks, against her lips
       I bob,
    And on her withered dewlap pour the ale.

(iii)   So we grew together,
    Like to a double cherry, seeming parted,
    But yet a union in partition ;
    Two lovely berries moulded on one stem.

(iv) But, like in sickness, did I loathe this food;
    But, as in health, come to my natural
      taste,
    Now I do wish it, love it, long for it.
    And will for evermore be true to it.

(v) Out of this silence yet I pick'd a welcome ;
    And in the modesty of fearful duty
    I read as much as from the rattling tongue
    Of saucy and audacious eloquence.

(*d*) *To be answered only by candidates* whose
    mother-tongue is English.

Justify the following critical remark regarding
A Midsummer-Night's Dream :

    ". Nothing in the play is Greek, excepting
    the names."

(*e*) *To be answered by candidates* whose
    mother-tongue is English.

Describe the character of Captain Smollett,
supporting your statements by brief references to
incidents in " Treasure Island."

THIRD PAPER.

Time—Three hours

For candidates whose mother-tongue is English.
All questions should be attempted but long
answers are not required.

1. Write an essay of from three to four pages of your answer-book on " The value of the æroplane as a means of communication. "

2. (*a*) Give a clause analysis of the following passage :—

Creeping* along under the high stone walls and bending down they pushed on still, until,* coming to the open moor, and receiving for the first time the terrible tornado full in their faces, the horses reared up and refused to proceed ; but, being got side by side,* and their heads being homeward, they managed* to get on though the rain upon their faces was agonizing.

(*b*) Parse the words followed by an asterisk.

3. Write *brief* notes on :—The Adventures of Tom Jones, Gulliver's Travels, Byron, Christopher Marlowe, Edmund Spenser.

4. What is the difference between " Modern Prose " and the " Older Prose " as represented in the works of Milton and Jeremy Taylor ? What brought about this change ?

5. (*a*) Two great dominant movements influenced the literature of " The age of Tennyson." Explain this.

Or.

(b) Indicate the changes which took place in Milton's mind as traceable in the poems L'Allegro, Il Penseroso, Comus and Lycidas.

THIRD PAPER

Time—Three hours

N.B.—*Immediately above your written answer, name the vernacular from which your translation is made.*

1. Translate into English :—

A

جوں ہی یہ معلوم ہوا کہ ہم لوگ اُس دن سفر نہ کرینگے
متصل شاہی میں سوداگروں کي ایک بہت اگ ننۓ ۔ یہ لوگ
ملک کي انوکھي چیزیں ہماروں کو دبانے آئے تھے ۔ سوداگري کي جو
چیزیں دکھائي گئیں اُن میں سب سے انوکھي چیز چکیں (blinds)
تھیں جو اِن گرم ملکوں میں دروازوں اور کوٹکوں پر اثر لگایا کرتے
ہیں ۔ یہ بانس کی پتلي پتلي تیلیوں کو ریشم کي قدوري سے باندھ
کر بنائي جاتي ہیں اور اِن پر طرح طرح کي خوبصورت تصویریں زینت
کے لئے بني رہتي ہیں ۔ سب کے اوپر خوبصورت لک (varnish)
رنگوں کي چمک بڑھاتا اور اس ڈاک جالي کے کم (trellis work)
کو نہایت دلگفتہ اور خورش نما کردیتا ہے ۔ اس شہر میں طرح طرح
کے خوشبردار ہار بھی بکتے ہیں *

B.

سچ تو یہ ہے کہ ہم لوگوں نے ایسے تفریح کا سفر کبھی نہیں کیا —
منظر سے تو برابر تفریح ہوتی ہی رہی — موسم بھی تھوڑا بہت
خوشگوار تھا رات بہت ٹھنڈی نہ تھی — لیکن اتنی تھی کہ آرام سے
سانس لی سکتے تھے — رات کے ایک بجے ہم لوگوں نے دیکھا کہ ایک
روشنی ہماری طرف بڑھتی آتی ہے جو ہماری ایسی تھی مگر اوس
میں مشعلیں نہ تیں اور تھوڑی دیر کے بعد دونوں میں فرق نہ رہا ٭
ہم لوگ ایک چھوٹے قصبے میں پہونچے اور ہم لوگوں کو کھانا کھانے
کے لئے ٹھہرنا پڑا اس مقام کے مجسٹریٹ نے جو ہماری راہ دیکھ رہا
تھا اپنے سب لائیں والوں کو ہمارے مہمانوں کی تعداد بڑھانے کو
بھیج دیا تھا — ہم لوگوں کو کھانا تیار ملا — سب کو بھوک بھی اچھی
تھی — اس کے بعد جو خدمتگار ہمارا ساتھ دینے آئے تھے اُن کو سلام
کرکے ہم نے پھر رات کا سفر شروع کیا ٭

2. Write an Essay of from four to six pages
of your answer-book on the following subject :—

A rich friend is to take you for a tour extend-
ing over eight months. What countries would
you arrange to visit? Give reasons for your
choice, and describe what you might expect to
see and do on this tour.

THIRD PAPER

Time—Three hours

N B.—*Immediately above your written ख answer name the vernacular from which your translation is made.*

1.   Translate into English :—

A

ज्योंही यह विदित होगया कि इनलोग उस दिन प्रस्थान न करेंगे । राजप्रसाद में व्यापारियों की एक भीड़ लग गई ।'यह लोग देश की खिलौनी चीज़ें हमलोगों को दिखाने आये थे । व्यापार की जो चीज़ें दिखाई गईं उनमें सब से विचित्र चीज़ चिक़ें (blinds) थीं जो इन गरम देशों में दरवाज़ों और खिड़कियों पर बहुधा लगाया करते हैं । एक बांस की पतली पतली तीलियों को, रेशम के डोरों से बांधकर बनाई जाती हैं और इनपर भांति भांति के सुन्दर चित्र शोभा के लिये बने रहते हैं । सद के ऊपर सुन्दर लुक़ (varnish) रंगों की चमक चढ़ाता और इस हलके जाली के काम (trellis work) को अत्यन्त प्रफुल्लित और शोभायमान कर देता है । इस नगर में भांति भांति के सुगंधित हार भी बिकते हैं ।

सच तो यह है कि इनलोगों ने ऐसे आनन्द की यात्रा कभी नहीं की । दृश्य से तो बराबर विनोद होता रहा, समय भी थोड़ा बहुत सोहावना था । रात बहुत ठंडी न थी पर इतनी थी कि खुब से सांस ले सकते थे । रातके एक बजे हमलोगों ने देखा कि एक रोशनी हमारी ओर बड़ी आरही है जो हमारी सी थी केवल उसमें मशालें न थीं और थोड़ी देर पीछे दोनों मिलगईं और दोनों में भेद न रहा ।

हमलोग एक छोटे नगर में पहुंचे । यहां हमलोगों को भोजनकरने के लिये ठहरना पड़ा । इस स्थान के मजिस्ट्रेट ने जो हमारी राह देख रहा था अपने सारे लालटेन वालों को हमारे रक्षकों की संख्या बढ़ाने के लिये भेजा था । हमलोगों को भोजन तैयार मला और सब को मूख भी अच्छी थी ।

इसके पीछे जो सेवक हमारा साथ देने आये थे उनको सलाम करके हमलोग फिर रात की यात्रा को चल खड़े हुये ।

2.   Write an Essay of from four to six pages of your answer-book on the following subject :—

A rich friend is to take you for a tour extending over eight months. What countries would you arrange to visit? Give reasons for your choice, and describe what you might expect to see and do on this tour.

Intermediate Examination Papers, 1921.

ENGLISH.

FIRST PAPER.

N.B.—Marks will be deducted for illegible writing and for bad composition.

1. [The answer to this question should not occupy more than three pages of your answer-book.]

Either,

(*a*) What arguments did Socrates bring forward against the suggestion that he should escape from prison.

Or.

(*b*) Describe the difficulties of travelling in England during the latter half of the seventeenth century.

2. Explain briefly with reference to the context the meaning of any *five* of the following :—

(*i*) And so young men learn these things from me, when they can often buy places in the theatre for a drachma at most, and laugh Socrates to scorn, were he to pretend that these doctrines too, are his.

(*ii*) Then what is a suitable reward to be given to a poor benefactor, who requires leisure to exhort you ? There is no reward, Athenians,

so suitable for him as a public maintenance in the Prytaneum.

(*iii*) "To him who *sends forth* the expedition," said the astrologer, after a pause. " this conjunction doth indeed promise success ; but methinks that Saturn, being combust, threatens danger and infortune to the party *sent*."

(*iv*) " How now, ye porkers of Liege ! ye wallowers in the mud of the Maes ! do ye dare to mate yourselves with the Wild Boar of Ardennes! Up ye Boar's brood ? let these Flemish hogs see your tusks !

(*v*) His ignorance and uncouthness, his low tastes and gross phrases, would, in our time, be considered as indicating a nature and a breeding thoroughly plebeian. Yet he was essentially a patrician, and had, in large measure, both the virtues and the vices which flourish among men set from their birth in high place.

(*vi*) Each of the two cities which made up the capital of England had its own sphere of attraction. In the metropolis of commerce the point of Convergence was the Exchange ; in the metropolis of fashion the Palace. But the Palace did not retain its influence so long as the Exchange.

3. Explain in your own words the meanings of the phrases in italics of either (not both) of the following passages :—

(*a*) *Latitudinarianism was held in horror by the country person. He took, indeed, more pride*

in his ragged gown than his superiors in their lawn and their scarlet hoods. The very consciousness that there was little in his worldly circumstances to distinguish him from the villages to whom he preached *led him to hold immoderately high the dignity of that sacerdotal office which was his single title to reverence.* Having lived in seclusion, and having had little opportunity of correcting his opinions by reading or conversation, *he held and taught the doctrines of indefeasible hereditary right*, of passive obedience, and of non-resistance, in all their crude absurdity. *Having been long engaged in a petty war against the neighbouring dissenters*, he too often hated them for the wrong which he had done them, and found no fault with the Five Mile Act and the Conventicle Act, *except that those odious laws had not a sharper edge.*

Or,

(b) The war between wit and Puritanism soon became a war between wit and morality. *The hostility excited by a grotesque caricature of virtue did not spare virtue herself. Whatever the canting Roundhead had regarded with reverence was insulted.* Whatever he had prescribed was favoured. *Because he had been scrupulous about trifles, all scruples were treated with derision.* Because he had covered his failings with the mask of devotion, *men were encouraged to obtrude with cynic impudence all their most scandalous vices on the public eye.* Because he had punished illicit love with barbarous severity,

virgin purity and conjugal fidelity were made a jest. *To that sanctimonious jargon which was his shibboleth, was opposed another jargon not less absurd and much more odious*   As he never opend his mouth except in scriptural phrase, *the new breed of wits and fine gentleman never opened their mouths without uttering ribaldry of which a porter would now be ashamed.*

4.   Give a clause analysis of the following passage :—

> *N.B.*—Write out the phrases fully ; words should not be represented by dots.

Quentin Durward, though. like the Scottish youth of the period, he had been early taught to look upon arms and war, thought he had never seen a more martial-looking, or more completely equipped and accomplished* man-at-arms than now saluted* him in the person of his mother's brother ; yet he could not but* shrink a little* from the grim expression of his countenance, while, with its rough mustachios, he brushed first the one and then the other cheek of his kinsman, welcomed his nephew to France, and in the same breath, asked what news from Scotland.

5.   Parse the words marked with an asterisk in the paasage quoted in question 4.

SECOND PAPER.

N.B.—Marks will be deducted for illegible writing and for bad composition.

1. Explain and annotate any *three* of the following passages :—

(a) Hands, that the rod of empire might
        have swayed,

   Or waked to ecstasy the living lyre.

(b) Far from the madding crow's ignoble
        strife,

   Their sober wishes never learned to
        stray.

(c) E'en from the tomb the voice of Na-
        ture cries ;

   E'en in our ashes live their wonted fires.

(d) Some mute inglorious Milton here may
        rest,

   Some Cromwell guiltless of his coun-
        try's blood,

2. Rewrite any *one* of the following passages in clear and simple prose :—

(a) Their level life is but a smouldering fire,
   Unquenched by want, unfanned by
        strong desire ;
   Unfit for raptures, or, if raptures cheer
   On some high festival of once a year,
   In wild excess the vulgar breast takes.
        fire,
   Till, buried in debauch, the bliss
        expire.

(b) And thou, fair Freedom, taught, alike·
        to feel
   The rabble's rage and tyrant's angry
        steel,

> Thou transitory flower, alike undone
> By proud contempt, or favour's foster-
> ing sun,
> Still may thy blooms the changeful
> clime endure !
> I only would repress them to secure.

3.   Explain, with reference to the context, any *three* of the following passages : —

(a) Though round its breast the rolling
    clouds are spread,
    Eternal sunshine settles on its head.

(b) And while he sinks without one arm to
    save.
    The country blooms—a garden, and a
    grave.

(c) Thou guide by which the nobler arts
    excel,
    Thou nurse of every virtue, fare thee
    well.

(d) Obscure, it sinks, nor shall it more im-
    part
    An hour's importance to the poor man's
    heart.

4.   Give a clause-analysis of the following passage, and parse the italicised words : —

Since words are only names for things, it would be more convenient for all men to carry about them such things as are necessary *to* *express* the particular business they are to dis-course *on*.

N. B.—Question 5 and 6 are set for all candidates, *except those whose mother-tongue is English.* Question 5A and 6A ara set for *only those candidates whose mother-tongue is English.*

FOR ALL EXCEPT THOSE WHOSE MOTHER-TONGUE IS ENGLISH.

5. Give in your own words the meaning of the phrases italicised in the following passage :—

The most unhappy of all men is the man that cannot tell what he is going to do, that *he has got no work cut out for him in the world*, and does not go into it. For work is the *grand cure for all the maladies and miseries* that ever beset mankind—honest work, which you intend getting done. *If you are in a start*, a very good indication as to choice—perhaps the best you could get—is a book you have a great curiosity about. You are then in the readiest and best of all possible condition to improve by that book. *it is analogous to what doctors tell us about the physical health* and appetites of the patient. You must learn to distinguish between false appetite and real. *There is such a thing as false appetite.* which will *lead a man into vagaries* with regard to diet ; will *tempt him to eat spicy things* which he should not eat at all, and would not *but that they are tasteful*.and for the moment in baseness of mind. A man ought to inquire and find out what he really and truly has an appetite for—*what suits his constitution* ; and that doctors tell him is the very thing he ought to have in general. And so with books.

6. State carefully what the author says in the
above passage about books.   What kind of books
would be merely tasteful in your opinion, and
why ?

For Candidates whose mother-tongue is English.

5A. Explain, with reference to the context
any *four* of the following passages :—

> (*a*) O then, what graces in my love do
>   dwell,
>   That he hath turned a heaven unto a
>   hell.

> (*b*) If you have any pity, grace, or man-
>   ners,
>   You would not make me such an
>   argument.

> (*c*) But we are spirits of another sort ;
>   I with the morning's love have oft
>   made sport.
>   And like a forester the groves may
>   tread.

> (*d*) Take the Gorges, Pew, and don't
>   stand here squalling.

> (*e*) Oh ! stow that ! don't you get sucking
>   of that bilge, John.
>   Let's have a go of the rum.

> (*f*) The ship was talking. sailors say,
>   loudly, treading the innumerable

ripples with an incessant weltering splash.

6A. Discuss the title of "*A Midsummer Night's Dream.*"

When does the action take place?

Or,

Sketch, in the words of the Sea Cook, the life of the pirates on the Island from their first landing to their capture of the cabin-boy.

THIRD PAPER.

For candidates whose mother-tongue is English.

1. Write an essay of from three to four pages of your answer-book on " the effects of war upon national character."

2. Give a clause analysis of the following passages :—

A great part of the education of every child consists of those impressions, visual and other which the senses of the little being are taking in busily, though *unconsciously,* amid the scenes of their first exercise ; and though all sorts of men are born in all sorts of places—*poets* in towns, and prosaic men amid fields and woody solitudes— yet, *consistently* with this. *it* is also true that much of the original capital on which all men

trade intellectually through life, consists of that mass of miscellaneous fact and imagery which they have acquired imperceptibly by the observations of their early years.

3.   Parse the four words italicised in the above passage.

4.   As English verbs possess no inflexions to form the future tense, how are the ideas of simple futurity, of intention, and of compulsion respectively expressed ? Give examples.

5.   What in your opinion is the essential difference between Poetry and Prose ?

Or,

Which is best English satire you know of ? What or whom does it satirise ?

6.   Write brief notes on :—

The School for Scandal ; An Essay on Man ; the heroic Couplet ; Cowper ; Wordsworth.

(THIRD PAPER (URDU).

N.B.—Immediately above your written answer,
name the vernacular from which your
translation is made.

1.   Translate into English :—

A.

ٹیونس (Tunis) کے سب سے بڑے بازار مصالحہ - خوشبو اور
گھڑیوں کے ہیں - دکانیں ایسی تنگ ہیں کہ دکاندار نہ اُن میں سیدھا
بیٹھ سکتا ہے اور نہ مڑ سکتا ہے - ایسے ہی وہ اپنا عجیب لباس پہنے
دن بھر بیٹھا رہتا ہے نہ اپنے گاہکوں کو بلاتا ہے اور نہ اُن کو اپنا
سودا مول لینے کے لئے کوئی ترغیب دیتا ہے - اگر ہفتوں تک اُس کا
کچھ بھی نہ بکے تو اُسے کوئی شکایت نہیں - گھڑیوں کا بازار بالکل
بہرودیوں کے ہاتھ میں ہے - یہاں کی دکانیں بھی ویسی ہی چھوٹی چھوٹی
ہیں اور اِنکی ساری بڑنجبی میں دو چار کانوں کی بالیاں -
آدھی درجن چھلے - ہاتھ کے کڑے اور پاؤں کے کڑے رہتے ہیں مشرقی
ملکوں کے لوگ عموماً اور عورتیں خصوصاً گھڑیوں کو سب چیزوں سے
زیادہ چاہتی ہیں اور کوئی تحفہ اُنہیں خوش کرنے کے لئے گھڑی سے
بڑھ کے نہیں - ان گھڑیوں کا کام اکثر بھدا اور موٹا ہوتا ہے - جو کچھ
مہین کام ہے وہ یورپ سے لایا ہوا ہے *

B.

اگلے دنوں لڑائی کے زمانے میں سب سے شدید دشمن جس کا سامنا
کرنا پڑتا تھا وہ بیماری تھی - تھوڑے سے عدد دیکھنے سے ظاہر ہوجائیگا
کہ اگلے دنوں میں دشمن کی کوششوں کے مقابلے میں فوج کے واسطے
بیماری کتنی خطرناک رہی ہے - نیپولین کی لڑائیوں میں زخم کھا کے

انگلنڈ کے جتنے آدمی مرے اُن کے دس گنی بیماری سے ضایع ہوے –
ایک حجازے میں اُس سے زیادہ بیماری آدمی سے مرگئے جتنے پچھلی
گرمی کی لڑائی میں تمام وجہوں سے ملا کے ضایع ہوئے تھے – کریمیا
کی لڑائی میں بیماری سے انگریزوں کا نقصان اکیس ہزار جانوں کا ہوا
حالانکہ لڑائی میں صرف چار ہزار کام آئے – جنوبی افریقہ کی لڑائی میں
بیس اکیس ہزار سے کچھہ زائد سپاہی گیائل ہوکے اسپتالوں میں آئے
اور بیمار ہوکے چار لاکہہ سے اوپر داخل ہوئے – آج کل کی بڑی لڑائی
میں یہ حساب لگایا گیا ہے کہ لڑکر دس مرے تو بیماری سے ایک
ہی مرا – یہ عجیب انقلاب فوج میں علاج کی بڑی ترقی کی وجہ سے
ہوا ہے – یہہ سچ ہے کہ آج کل کی لڑائی میں جان لینے کے طریقے
میں کمال حاصل ہوگیا ہے لیکن علاج اور بیماری سے بچتے کی تدبیروں
میں اس سے زیادہ ترقی ہوئی ہے *

2.   Write an essay of from four to six pages
of your answer-book on the following subject :—

The peculiarities in character and customs
of the people in any district with which you are
familiar.

THIRD PAPER (URDU)

N.B.—Immediately above your written answer
name the vernacular from which your transla-
tion is made.

1.   Translate into English :—

A

ट्यूनिस (Tunis) के सब से बड़े बाज़ार, मसाले, सुगन्ध और
गहनों के हैं। दुकानें ऐसी सँकड़ी हैं कि दुकानदार न उनमें सीधा
बैठ सकता हैं और न मुड़ सकता है । ऐसे ही वह अपना

विचित्र पहिनावा पहिने दिन भर बैठा रहता है न अपने ग्राहकों को चुनता है और न उनको अपना सौदा मोल लेने के लिये किसी उपाय से आकर्पित करता है। कई सप्ताह तक उसका कुछ भी न बिके तो उसे शिकायत नहीं। गहनों का बाज़ार बिल्कुल यहूदियों के हाथ में है। यहां की दुकानें भी वैसी छोटी छोटी हैं। और उनकी सारी पूंजी में दो चार कानों की बालियां, आधा दर्जन छल्ले, हाथ के कड़े और पांवों के कड़े रहते हैं। पूर्व देश के लोग, विशेष कर यहां की स्त्रियां गहनों को सब से अधिक चाहती हैं और उनको प्रसन्न करने के लिये गहने से बढ़ कर कोई भेंट नहीं होती। इन गहनों का काम बहुधा मोटा और आकार भद्दा होता है। जो कुछ महीन काम है वह यूरप से लाया हुआ है॥

B

अगले दिनों में लड़ाई के समय में सब से बड़ा बैरी जिसका सामना करना पड़ता था वह रोग था। कुछ थोड़ी सी संख्या देखने से विदित हो जायगा कि अगले दिनों में बैरी के प्रयत्नों की अपेक्षा सेना के लिये रोग कितना भयंकर घातक रहा है। नेपोलियन की लड़ाइयों में, लड़ाई में घाव खाकर वेलिंगटन के जितने मनुष्य मरे उनके दसगुने रोग से नष्ट हुए। पिछली गरमी की लड़ाई में सब कारणों को मिलाकर जितने मनुष्य मरे थे उससे अधिक एक जाड़े में रोग से मर गये। क्रिमिया की लड़ाई में रोग से अंग्रेजों की हानि २१,००० की हुई। लड़ाई में केवल ४,००० मरे। दक्षिण अफ्रिका की युद्ध में भी २१,००० से कुछ अधिक सिपाही घायल होकर अस्पतालों में आये और बीमार होकर ४ लाख से ऊपर भरती हुये। आजकल की बड़ी लड़ाई में यह हिसाब लगाया गया है कि लड़कर दम मरें तो बीमारी से एक ही मरा। यह अद्भुत परिवर्त्तन, सेना में

चिकित्सा की बड़ी उन्नति के कारण हुआ है । यह सच है कि आज
कल की लड़ाई में प्राण हरण की रीति में सिद्धिप्राप्त हुई है परंतु
चिकित्सा और रोग से बचने के उपायों में उससे बढ़ कर उन्नति
हुई है ॥

2. Write an essay of from four to six pages
of your answer-book on the following subject :—

The peculiarities in character and customs of
the people in any district with which you are
familiar.

———

Intermediate Examination Papers, 1922.

ENGLISH.

FIRST PAPER.

N.B.—Marks will be deducted for illegible writing and for bad composition.

1. [The answer to this question should not occupy more than three pages of your answer-book.]

Either,

(*a*) Give in your own words the address delivered by Socrates to the Athenians *after he was condemned to death.*

Or

(*b*) Describe the adventures of Micah Clark from the time he was captured by the smugglers until he arrived at Badminton.

Or,

(*c*) Reproduce in your own words the scene from "A Tale of Two Cities," which describes the heroism of Sydney Carton.

2. Explain briefly, with reference to the context, the meaning of any *five* of the following :—

(i) But you preferred neither Lacedaemon nor Crete, though you are fond of saying that they are well governed, nor any other state, either of the Hellenes or the Barbarians. You

went away from Athens less than the lame and the
blind and the cripple.

(ii) Masses of water shivered and shook the
beach with a booming sound ; every shape tum-
ultuously rolled on, as soon as made, to change
its shape and place, and beat another shape and
place away ; the ideal shore on the horizon, with
its towers and buildings, rose and fell.

(iii) After this, there was a good deal of
dodging about and hitching up of the inexpressi-
bles in the absence of braces, and then the short
sailor (who was the moral character evidently, for
he always had the best of it) made a violent de-
monstration and closed with the tall sailor, who
after a few unavailing struggles, went down, and
expired in great torture.

(iv) I have seen such a stiffness before now.
The man hath a straight sword within the leg of
his breeches. When he is on safe ground he
will produce it—aye, and use it too, but until he
is out of all danger of falling in with the king's
horse he is shy of strapping it to his belt. There
is another ahead of him there, with his head of
a scythe inside his smock.

(v) Oh, war my friend, what terrible thing
it is ! How are men cozened and cheated by the
rare trappings and prancing steeds, by the empty
terms of honour and of glory, until they forget
in the outward tinsel and show the real ghastly
horror of the accursed thing !

(vi) Unjust and absurd taxation to which men
are accustomed is often borne far more willingly
than the most reasonable impost which is new.
It was not till many tall bars had been violently
pulled down, till the troops had in many district
been forced to act against the people, and till
much blood had been shed, that a good system
was introduced.

3. Explain in your own words the meaning
of the phrases in italics of either (not both) of the
following passages :—

(a) In consequence partly of our geographi-
cal and partly of *our moral position*, we have,
during several generations, been exempt from
*evils which have elsewhere impeded the efforts
and destroyed the fruits of industry.* While
every part of the Continent, from Moscow to
Lisbon, has been the theatre of bloody and de-
vastating wars, *no hostile standard has been
seen here but as a trophy.* While revolutions
have taken place all around us, *our government
has never once been subverted by violence.* Dur-
ing more than a hundred years there has been in
our island no tumult of sufficient importance to
be called an insurrection ; *nor has the law been
once borne down either by popular fury or by
legal tyranny : public credit has been held
sacred :* the administration of justice has been
pure : even in times which might by Englishmen
be justly called evil times, *we have enjoyed what
almost every other nation in the world would have*

considered as an ample measure of civil and religious freedom.

Or,

(b) It is the universal law that whatever pursuit, whatever doctrine, becomes fashionable, shall lose a portion of that dignity which it had possessed while it was confined to a small but earnest minority, and was loved for its own sake alone. It is true that the follies of some persons who, without any real aptitude for science, professed a passion for it, *furnished matter of contemptuous mirth to a few malignant satirists who belonged to the preceding generation, and were not disposed to unlearn the lore of their youth.* But is not less true that *the great work of interpreting nature was performed by the English of that age as it had never been performed in any age by any nation. The spirit of Francis Bacon was abroad, a spirit admirably compounded of audacity and sobriety. There was a strong persuasion that the whole world was full of secrets of high moment to the happiness of man,* and that man had, by his Maker, been entrusted with the key which, rightly used, would give access to them.

4. Give a clause analysis of the following passage :—

(*N.B.*—Write out the phrases : fully ; words should not be represented by dots.)

When they had their laugh out, which did not happen very soon, for give* John an inch that

way, and he was sure* to take several ells, being
a jovial, good-tempered fellow, they looked about
them more closely groping among the lumber for
any stray means o f enlightenment that might turn
up. But the books were marked with· a variety
of owners' names, having, no doubt,* been bought
at sales, and collected here and there at different
times ; whether any one of these names belonged
to Tom's employer, and, if so,* which of them,
they had no means whatever of determining."

SECOND PAPER.

1. Explain and annotate any *three* of the
following passages :—

> (a) Another sight had seen that morn,
>   From Fate's dark book a leaf been
>   torn,
>   And Flodden had been Bannock-
>   bourne.

> (b) He heard the Angelus from convent
>   towers,
>   As if the better world conversed with
>   ours.

> (c) About, about. in reel and rout
>   The death-fires danced at night ;
>   The water, like a witch's oils,
>   Burnt green, and blue, and white.

> (d) ......Never more
>   Shall the lake glass her, flying over
>   it ;

> Never the black and dripping pre-
>   cipices
> Echo her stormy scream as she sails
>   by.

   (e) Such times have been not since the
>   light that led
> The holy elders with the gift of
>   myrrh.

2. Rewrite in simple prose *one* of the two
following passages :—

   (a) At length the freshening western
>   blast
> Aside the shroud of battle cast;
> And, first, the ridge of mingled spears
> Above the brightening cloud appear :
> And in the smoke the pennons flew,
> As in the storm the white sea-mew.
> Than mark'd they dashing broad and
>   far,
> The broken billows of the war.

               Or,

   (b) ......The great brand
> Made lightnings in the splendour of
>   the moon,
> And flashing round and round, and
>   whirl'd in an arch,
> Shot like a streamer of the northern
>   morn.
> Seen where the moving isles of
>   winter shock
> By night, with noises of the northern
>   sea.

3. Explain, with reference to the context, any *three* of the following passages :—

> (a) In single file they move, and stop their breath
>> For fear they should dislodge the o'erhanging snows.

> (b) Unworthy office here to stay !
>> No hope of gilded spurs to-day.—

> (c) Under the Angel's governance benign,
>> The happy island danced with corn and wine.

> (d) I heard the water lapping on the crag,
>> And the long ripple washing in the reeds.

> (e) When the ivy-tod is heavy with snow,
>> And the owlet whoops to the wolf below,
>>> That eats the she-wolf's young.

4. Parse the words in italics in the following passage :—

> For we are *all*, like swimmers in the sea,
> *Pois'd* on the top of a huge wave of Fate,
> Which hangs *uncertain* to which side *to fall.*
> And *whether* it will heave us up to land,
> Or whether it will roll us *out* to sea,
> *Back* out to sea the deep waves of death,
> We know not, and no search will make us *know.*

5. [For all candidates except those whose
mother-tongue is English.]

We have to be on our guard against small
troubles which *by encouraging* we are apt to
magnify into great ones. Indeed, *the chief source
of worry* in the world is not real but imaginary
evil—small vexations and *trivial afflictions.* In
the presence of a great sorrow all petty troubles
disappear ; but we are too ready *to take some
cherished misery to our bosom and to put it there.*
Very often it is *the child of our fancy*; and for-
getful of the many means of happiness which lie
within our reach we *indulge this spoilt child of
ours* until it masters us. *We shut the door
against cheerfulness* and surround ourselves
with gloom. The habit *gives a colouring to* our
life. We grow *querulous, moody,* and unsympa-
thetic. Our conversation becomes full of regrets.
We are harsh in our judgment of others. We are
unsociable and think everybody else is so. *We
make our breast a storehouse of pain*, which we
inflict upon ourselves as well as upon others.

(*a*) Give, *briefly*, in your own words the
substance of what is said above about small trou-
bles and their effect on character.

(*b*) Explain clearly the expressions in it-
alics.

5. (4) [For all candidates whose mother-
tongue is English.]

Explain, with reference to the context, any

four of the following passages :—

> (a) .... Hoary-headed frosts
> Fall in the fresh lap of the crimson rose.
> And on old Hiems' thin and icy crown
> An odorous chaplet of sweet summer
>   buds
> Is, as in mockery, set.

> (b) But earthlier happy is the rose distill'd
> Than that which withering on the
>   virgin thorn
> Grows, lives and dies in single blessed-
>   ness.

> (c) I pray you, though you mock me, gen-
>   tleman.
> Let her not hurt me ; I was never curse ;
> I have no gift at all in shrewishness ;
> I am a right maid for my cowardice.

> (d) You come aboard along of us, and then
> I'll give you my affy-davy to clap you
> somewhere safe ashore. Or., if that ain't to your
> fancy some of my hands being rough and having
> old scores on accout of hazing, then you can stay
> here,

> (e) For while the ship kept bucking and
> siding like a vicious horse, the sails filling, now
> on one tack, now on another and the boom
> swinging to and fro till the mast groaned aloud
> under the strain.

> (f) "Quarters" he roared. "Gray," he said,
> "I'll put your name in the log ; you've

Stood by your duty · like a seaman,
  Doctor,
I thought you had worn the king's coat.
If that was how you served at Fontenoy,
You'd have been better in your berth.

(B) Sketch the character of Squire Trelawney
and show how it affects the plot of the story.

Or,

Justify the following statements : "The
action of A Midsummer Night's Dream is very
varied. There are really four distinct elements
in the plot."

THIRD PAPER

[For Candidates WHOSE MOTHER-TONGUE
IS ENGLISH.]

1. Write an essay of three o   of
your answer-book on "The quali   ; a ·
great man."

2. Give a clause analysis (1g
sentence :—

Even Napoleon, who had a r   n-
ception and of action so far *surj*   )f
other kings and commanders tha   1s
almost superhuman, said that wh   )t
quite know what ought *to be* done   ʿa
do nothing at all.

3. Parse the five words it   1e
above sentence.

4. What in your opinion constitutes a good novel ? Illustrate your remarks.

5. Correct the following sentences, giving reasons for your corrections :—

(*a*) For ever in this humble cell
Let thee and I, my fair one, dwell.

(*b*) Three courses suggest themselves to me but neither of these, or indeed any other seem acceptable to the President. whom people think is one of the most incompetent men that has ever occupied the chair.

(*c*) Trevelling along the line, the tower of the castle came in sight.

(*d*) There goes John with both his dogs on either side of him.

(*e*) She had a very fair complexion, and which was quite different to her sister's.

6. Write ahort notes on any three of the following :—

Much ado about nothing ; the Hind and the Panther ; Childe Harold's Pilgrimge ; Falstaff; Lyric poetry ; the Vicar of Wakefield

THIRD PAPER (URDU)..

N.B.—Immediately above your written answer name the vernacular from which your translation is made.

1, Translate into Engclish:—

جعله (Gaffa) کے رہنے والوں کی بسر اوقات کا اکثر ذریعہ کہجور کا درخت ہے – کھجور کا تنہ ان کے جھونپڑوں کے لئے لکڑی کا کام دیتا

ہے - ڈالیوں کی چھاڑنی ہوتی ہے - اندر کی چھال ٹوکریوں اور
چٹائیوں کے بنانے میں کام آتی ہے - کہجور خود کھائی جاتی ہے اور
آخری چیز یعنی اوس کا رس تازہ رہتا ہے تو ٹھنڈا اور مزے دار شربت
اور کھانے کے چیز کی ضرورت ہو تو اس کے تبادلے میں مل جاتی
ہے - کامل عربوں کی نظر میں کہجور میں ایک اور بھی صفت ہے کہ
اسے بہت تھوڑی پرداخت کی ضرورت ہوتی ہے - بیابان کی آندھیوں
میں جب درخت اکیلے رہتے ہیں تو چوٹیاں اوپر کو باندھ دی جاتی
ہیں تاکہ ہوا کی ٹکر کو تھوڑی جگہ ملے - اُس وقت یہ خوبصورت
درخت درر سے بڑی بڑی اُلٹی ہوے چھتریوں کی طرح نظر آتے ہیں
کبھی کبھی کہجور کے درخت بغیر چوٹیوں کے بھی نظر آتے ہیں - اُن
کے اونچے کالے کالے اور بغیر پتوں کے تنے ہی دکھائی دیتے ہیں اور
چوٹی کی جگہہ اونچے سرے پر ایک بہت بڑی پیال کی ٹوپی سی
(Straw-hat) رہ جاتی ہے - یہ وہی درخت ہیں جو تازی نکالنے کے
لئے چھیدے جاتے ہیں اس کام کے لئے عرب کے لوگ چوٹی میں ایک گہرا
شگاف دے دیتے ہیں جس میں سے میٹھا دودھیا رس نکلتا ہے اور برتنوں
میں روک لیا جاتا ہے لیکن رس کو فوراً کام میں لانا چاہئے کیونکہ دوہی
ایک دن میں لس لس اُٹھنے لگتا ہے اور اُس میں نشہ پیدا ہوجاتا ہے -
اس طریقہ سے چھیدے ہوے درختوں میں پھل نہیں لگتے کبھی اسی سال
کبھی دو سال تک اور ایسا بھی ہوتا ہے کہ وہ سوکھ جاتے ہیں -
کبھی کبھی مضبوط درخت نئی سال تک چھیدے جاسکتے ہیں *

2. Write an essay of from four to six pages of
your answer-book on the following subject :—

The most popular indoor and outdoor amuse-
ments sought, (1) by the educated classes, and
(2) by the illiterate people in India.

THIRD PAPER.

N. B.—Immediately above your written answer
name the Vernacular from which your
translation is made.

1.   Translate into English :—

गक्का (Gaffa) के रहने वाब्बों के जीविका निर्वाह का एकमात्र
साधन खजूर का पेड़ है । खजूर का तना इनके झोपड़ों के लिये
लकड़ी का काम देता है, डालियों की छावनी होती है, भीतर की
छाल टोकरियों और चटाइयों के चनाने में काम आती है, खजूर
खाई हो जाती है और अंतिम वस्तु उसका रस टटका रहता है तो
ठंढा मज़ेदार शरघत है । और खाद्य वस्तु की उनको आवश्यकता हो
तो इसके बदले मिल जाती है । आलसी अरबों की दृष्टि में खजूर में एक
और भी गुण है, इसको बहुत थोड़ी सेवा बरदास्त चाहिये । ऊसर
की आंधी में जब पेड़ अकेले रहते हैं तो चोटियां ऊपर को बांध दी
जाती हैं जिसमें हवा के टक्कर को थोड़ी जगह मिले । और उस
समय यह सुन्दर पेड़ दूर से बड़े बड़े उलटे हुये छातों की भांति
दिखाई देते हैं । कभी कभी खजूर के पेड़ बिना चोटियों के भी देख
पड़ते हैं । इनके ऊंचे ऊंचे काले काले और बिना पत्तों के तने ही
देखे जाते हैं और चोटी की जगह ऊंचे सिरे पर एक बहुत बड़ी
पयाल की टोपी सी (Straw-hat) रह जाती है । यह वही पेड़
है जो ताड़ी निकालने के लिये पाछे गये हैं । इस काम के लिये अरब
के लोग चोटी में एक गहिरा घाव कर देते है जिसमें से मीठा
दुधिया रस निकलता है और बरतनों में रोप लिया जाता है परन्तु
रस को चटपट काम में लाना चाहिये क्योंकि दो ही एक दिन में
इसमें जहन उठता है और उससे नशा होता है । इस रीति से पक्के

I.E.—11

हुये पेड़ों में फल नहीं लगते कभी उसी साल कभी दो साल तक
और ऐसा भी होता है कि वह सूख जाते हैं। कभी कभी वलिष्ठ वृत्त
कई साल तक पाछे जा सकते हैं ।

2. Write an Essay of from four to six pages
of your answer-book on the following subject :—

The most popular indoor and outdoor amuse-
ments sought, (1) by the educated classes, and
(2) by the illiterate people in India.

Intermediate Examination Papers, 1923.

ENGLISH.

FIRST PAPER.

Time—Three hours.

N. B.—*Marks will be deducted for illegible writing and for bad composition.*

1. [*The answer to this question should not occupy more than three pages of your answer-books.*]

Either,

(*a*) In what way had Socrates offended the Athenians ? How did he defend himself when bought to trial ?

Or,

(*b*) Who was Decimus Saxon and what business brought him to Havant ? Describe how he found Joseph Clarke.

Or,

(*c*) Describe Tom Pinch's journey by coach from Salisbury to London.

2. Explain, with reference to the context, the meaning of any *five* of the following :—

(i) " Let me punish the evil-doer and straightway die " he said, " that I may not remain here by the beaked ships, a scorn of men, encumbering the earth."

(ii)   The first care of the two unspilt friends
was to extricate their unfortunate companions
from their bed of quickset—a process which gave
them the unspeakable satisfaction of discovering
that they had sustained no injury, beyond sundry
rents in their garments and various lacerations
from the brambles.

(iii)   One was the first ambassador whom the
New World of Letters sent to the Old. He was
born almost with the republic; the *pater patriae*
had laid his hand on the child's head.

(iv)   Fortune is like the market, where many
times, if you can stay a little, the price will fall.
And again it is like Sibylla's offer, which at first
offereth the commodity at full, then consumeth
part and part, and still holdeth up the price.

(v)   " Mere proclamations addressed to the
commonalty will not catch these gold fish. They
are not to be angled for with a naked hook."

(vi)   Seventy breezy miles a day were written
in his very whiskers. His manners were canter;
his conversation a round trot.

3.   Answer the questions on *one* only of the
following passages either (*a*) or (*b*) :—

(*a*)   I have lived to see generals who once had
crowds halloing after them wherever they went,
who were bepraised by newspapers and magazines
those echoes of the voice of the vulgar, and yet
they have •long sunk into merited obscurity,
with scarcely even an epitaph •left to flatter. A
few years ago the •herring fishery *employed all*

Grub Street : it was the topic in every coffee-house, and the burden of every ballad. *We were to drag up oceans of gold from the bottom of the sea* ; we were to supply all Europe with herrings upon our own terms.

> (1) Explain the passages in italics so as to bring out their full meaning.
>
> (2) Parse the words marked with an asterisk.
>
> (3) Give the meaning of ' epitaph,' ' coffee-house,' 'ballad.'

(*b*) Many Londoners—not all—have seen the British Museum Library. I have seen all *sort of domes of Peters, Pauls, Sophia, Pantheon,—what not ?—and have been struck by *none of them so *much as by *that catholic dome in Bloomsbury*, under which our million volumes are housed. What peace, what love, what truth, what beauty, what happiness for all, are here spread out ! It seems to me one cannot sit down in that place without a heart full of grateful reverence. *I own to have said my grace at the table*, and to have thanked heaven for this *my English birthright*, freely to partake of these bountiful books, and to speak the truth I find there.

> (1) Explain the passages in italics so as to bring out their full meaning.
>
> (2) Parse the words marked by an asterisk.
>
> (3) Give the meaning of ' struck,' ' to partake of,' 'bountiful.'

4. Give a clause analysis of the following passage:—

As Alexander VI was entering a little town in the neighbourhood of Rome, which had just been evacuated by the enemy, he perceived the townsmen busy in the market-place in pulling down from a gibbett a figure which had been designed to represent himself. There were also some knocking down a neighbouring statue of one of the Orsini family, with whom he was at war, in order to put Alexander's effigy, when taken down, in its place.

SECOND PAPER

Time—Three hours.

[N. B.—*Marks will be deducted for errors in English.*]

1. Write a short description—

    (*a*) Of what you consider to be the finest simile in the poem Sohrab and Rustum.

<p align="center">Or</p>

    (*b*) Of the last stand of the Socts at Flodden Field.

2. Explain, with reference to the contest *any three* of the following passages. Add notes when necessary:—

    (*a*) He holds him with his skinny hand,
       ' There was a ship,' quoth he.
      ' Hold off! unhand me, greybeard loon!
    Eftsoons his hand dropt he,

(b) ………… ………Hap what hap.
My basnet to a prentice cap,
Lord Surrey's o'er the Till.

(c) ' Girl ! nimble with thy feet, not with
thy hands !
Curl'd minion, dancer, coiner of sweet
words ! Fight,

(d) ………………For all his face was white
And colourless, and like the wither'd
moon
Smote by the fresh beam of the
springing East ;
And all his greaves and cuises dash'd
with drops of onset.

(e) The Pope received them with great
Pomp and blare
Of banner'd trumpets, on St. Peter's
Square.
Giving his benediction and embrace,
Fervent, and full of apostolic grace.

3. Rewrite in simple prose *one* of the following
passages :—

(a) The upper air burst into life ;
And a hundred fire-flags sheen ;
To and fro they were hurried about !
And to and fro, and in and out,
The wan stars danced between.

Or,

(b) But the other swiftly strode from ridge
to ridge,
Clothed with his breath, and looking,
as he walk'd.

> Larger than human on the frozen hills.
> He heard the deep behind him, and a cry
> Before. His own thoughts drove him like
> a goad.

4. Explain, with reference to the context, *any three* of the following passages :—

> (a) He prayeth best, who loveth best
>   All things both great and small.

> (b) ....That he might feel
>   The velvet scabbard held a sword of
>   steel.

> (c) Truth sits upon the lips of dying men,
>   And Falsehood, while I liv'd was far
>   from me.

> (d) For so the whole round earth is every
>   way
>
>   Bound by gold chains about the feet of
>   God.

> (e) The Border slogan rent the sky !
>   A Home ! A Gordon ! was the cry.

5. Make a clause-analysis of the following sentence, writing each clause at full length :—

He heard with great interest the royal assent given to a bill for raising fifteen hundred thousand pounds by land tax, and learned with astonishment that this sum, though larger by one half than the whole revenue which he could wring from the population of his immense Empire was but a small part of what the Commons of

England voluntarily granted every year to their constitutional King.

6. (For all candidates *except* those WHOSE MOTHER-TONGUE IS ENGLISH.)

How sickness enlarges the dimensions of a man's selfishness !

The invalid is *his own exclusive object.* Su-, preme Selfishness *is inculcated upon him* as his only duty. He has nothing to think of but how to get well. What happens out of doors or within them, *provided he does not hear the jarring of them,* affects him not.

A little while ago he was greatly concerned in the results of a law-suit, which was to be *the making or marring* of his dearest friend. He was to be seen *trudging about on his friend's errand, jogging this witness, refreshing that solicitor.* The case was to come off yesterday. He is absolutely as indifferent to the decision, *as if it were a question to be decided in Pekin.* Perhaps from some whispering going on within the house he picks up enough to make him understand that *things went cross-grained in the Court* yesterday and that his friend is ruined. But the word ' friend ' and the word ' ruin ' disturb him no more than so *much jargon.* He must think of nothing but how to get better. *He is wrapped in the callous hide of suffering.* *He keeps his sympathy under trusty lock and key,* *for his own use.* He lies pitying himself, moaning to himself : *he yearns over himself* to think what he suffers. He is for ever plotting how to

do some good to himself, *studying little strata-
gems and artificial alleviations.*

(*a*) From the above passage describe in your
own words the demoralising effects of Illness.

(*b*) Explain clearly the expressions in italics.

A.

[For those candidates WHOSE MOTHER-
TONGUE IS ENGLISH.]

(*a*) Contrast *briefly* the national character-
istics of the Normans and the native English of
the Danelagh at the time of the Conquest.

Or,

(*b*) Explain the symbolic nature of King
Arthur's coronation ceremony.

B.

Explain with reference to the context, *any
four* of the following passages. Add notes when
necessary :—

(*a*) 'As for pace one cannot expect that
with such a chuckle-head. If one rode her
through the town, the boys would call out, " All
head and no tail." Why I can't see her tail for
her croup, it is so ill set on.'

(*b*) "Take the pay and sail off with it, with-
out having done the work? That would be a
noble tale to carry home to your fair wives in
Jutland. I shall not call you niddering, being a
man of peace, as all know."

(c) " Hark to the witch's horse ! Hark to
the son of Fenris, how he calls for meat ! Are.
ye your fathers' sons, ye men of Bourne ? They
never let the grey beast call in vain."

(d) Dry clashed his harness in the icy
caves

And barren chasms, and all *to left and*
right

The bare black cliff clang'd round him.

(e) Seeing that ye be grown too weak and
old

To drive the heathen from your Roman
wall,

No tribute will we pay."

(f) " Rain, sun, and rain ! and the free
blossom blows :

Sun, rain, and sun ! and where is he
who knows ?

From the great deep to the great deep
he goes."

ENGLISH.

THIRD PAPER.

Time—Three hours.

N.B.—*Immediately above your written answer
name the vernacular from which your
translation is made.*

1. Translate into English :—

سیلون اپنے جواہرات کے لئے ہمیشہ سے مشہور رہا ہے ۔ اسکے
ساحل پر عمدہ موتی نکالے جاتے ہیں ۔ موتی نکالنے والی کشتیوں کے

بڑے بڑے بیڑے اُن کناروں کی طرف جن پر موتی پڑے رہتے ہیں روانہ
ہوتے ہیں ۔ لیکن موتی اتنی گہرائی میں ہوتے ہیں کہ اُن کو غوطہ
مار کر نکالنا پڑتا ہے ۔ غوطہ خور باری باری سے نیچے اُترتے ہیں ہر
ایک شخص ایک پتھر باندھے رہتا ہے تاکہ فوراً تہ تک پہنچ جاۓ ۔
وہاں آدھی منٹ میں یا جتنی دیر کہ وہ پانی میں ٹھیر سکتا ہے اُتنی
دیر میں جسقدر موتی وہ اٹھا سکتا ہے اٹھانے کی کوشش کرتا ہے ۔
جب وہ سانس نہیں روک سکتا تو اُن اوگروں کو جو کشتی میں ہیں ایک
رسی کھینچکر اشارہ کرتا ہے وہ لوگ اسۂکو فوراً اوپر کھینچ لیتے ہیں ۔
اس کو خاص اندیشہ ایک دریائی جانور سے جس کو shark کہتے
ہیں ہوتا ہے اس لئے ہر ایک کشتی میں ایک شارک پر جادو کرنے والا
آدمی موجود رہتا ہے اور ایسے بہی بہت سے جادوگر کنارے پر کھڑے ہوے
منتر پڑھا کرتے ہیں اور عجیب عجیب رسیں عمل میں لاتے ہیں جن
سے یہ خیال کیا جاتا ہے کہ شارک بیاگ جائیگا ۔ اگر غوطہ خوروں
میں سے کسی پر شارک حملہ کردیتا ہے تو کوئی اور غوطہ خور اُس دن
پانی میں گھسنے پر راضی نہیں ہوتا ۔ اس سے یہ ظاہر ہوتا ہے کہ
اُن لوگوں کو اپنے جادوگروں پر پورا بھروسہ نہیں ہے ٭

بنگالی لوگ کوئی مضبوط قوم نہیں ہیں ۔ اُن کی ملک کی گرم
اور تر آب و ہوا نے اُن کی جفا کشی اور ہمت کو بالکل غارت کردیا ہے ۔
اُن کی ایک عجیب بات یہ ہے کہ مرد عورتوں کی طرح اور عورتیں
مردوں کی طرح معلوم ہوتی ہیں دونوں کے لمبے لمبے بال ہوتے ہیں
اور یہ بتلانا کہ کون مرد ہے اور کون عورت بہت دشوار ہے ۔ جب
تک آپ اس بات پر غور نہ کریں کہ مرد اپنے لمبے بالوں کو ایک کنگھی
سے سمیٹے رہتے ہیں اور سفید دوت پہنے رہتے ہیں اور عورتیں اپنی
زلفوں کی چوٹی بنائر کانٹوں سے روکے رکھتی ہیں اور مختلف رنگوں کی
پوشاکوں پر ڈھیلی ڈھالی لمبی سفید جاکٹ پہنے رہا کرتی ہیں ٭

2.   Write a descriptive essay of from four to

six pages of your answer-book on the following subject :—

Some popular Indian Superstitions.

THIRD PAPER.
Time—Three hours.

N. B.—*Immediately above your written answer, name the vernacular from which your translation is made.*

1. Translate into English :—

लंका सदा अपने रत्नों के लिये प्रसिद्ध रहा है । इसके समुद्र तट पर उत्तम मोती निकाले जाते हैं । जिन तटों पर मोती पड़े रहते हैं उधर मोती निकालने वाली नावों के बड़े बड़े बेड़े चलते हैं पर मोती इतनी गहराई में रहते हैं कि उनको गोता मार कर निकालना पड़ता है । गोते ओर बारी बारी से नीचे उतरते हैं हर एक आदमी एक पत्थर बांधे रहता है जिससे वह जल्दी से तह पर पहुंच जाय । और वहां वह आधे मिनट में या जितनी देर वह पानी में ठहर सकता है, जितने मोती वह उठा सकता है उठाने को कोशिश करता है । जब वह सांस नहीं रोक सकता तो एक रस्सी खींच कर जो लोग नाव में रहते हैं उनको सूचित करता है और वह लोग उसे तुरन्त ऊपर खींच लेते हैं । उसको मुख्यतर एक जलजन्तु से होता है जिसे शार्क (Shark) कहते हैं । इस लिये हर एक नाव में शार्क पर जादू करने वाला एक मनुष्य रहता है और बहुतेरे जादूगर तट पर खड़े खड़े मंत्र पढ़ा करते और अनोखी रस्में किया करते हैं जिससे यह समझा जाता है कि शार्क भाग जायगा । और जो गोते ओरों में से किसी पर शार्क ने हमला कर दी दिया तो उस दिन कोई और गोताखोर पानीमें घुसना

अंगीकार न करैगा । इससे प्रगट है कि इनको जादू गरों पर पूरा भरोसा नहीं है ।

सिंघाली लोग बली जाति के नहीं होते । उनके देश की गरम और तर आबहवा उनका साहस और बल नष्ट किये हुये हैं । परदेशी के देखने में उनमें एक अनोखापन यह है कि पुरुष सी जान पड़ते हैं । और स्त्रियां पुरुष प्रतीत होती हैं । दोनों के लंबे बाल होते हैं और यह बतलाना कि कौन स्त्री है और कौन पुरुष बहुत कठिन है, जब तक आप यह ध्यान से न देखें कि पुरुष अपने लंबे बालों को कंघी से समेटे रहते हैं और बजला कोट पहिनते हैं और स्त्रियां अपनी लटों को चोटी बनाकर कांटे खोंसे रहती और रंग बिरंगे कपड़ों हैं ऊपर ढीली ढाली लंबी बजली जाकिट (jacket) पहिने रहा करती हैं ।

2. Write a descriptive essay of from four to six pages of your answer-book on the following subject:—

Some popular Indian Superstitions.

Intermediate Examination Papers, 1909.

MATHEMATICS.
FIRST PAPER

1. Solve
$$x^2 - xy + y^2 = 7, \quad x^4 + x^2 y^2 + y^4 = 133.$$

2. If the ratio of the roots of
$$x^2 + ax + b = 0$$
be equal to that of the roots of
$$x^2 + cx + d = 0$$
prove that
$$a^2 d = bc^2$$

3. Prove from first principles that the number of combinations of $(n+1)$ things taken r at a time is equal to the number of combinations of n things taken $r-1$ at a time together with the number of combinations of n things taken r at a time.

4. Find the co-efficient of m^4 in $\left(2m^2 - \dfrac{1}{m}\right)8$.

5. Define the logarithm of a number to a given base.

Prove from the definition that
$$\log ab = \log a + \log b.$$
If
$$\log 2 = \cdot 30103$$
find the logarithms of

$$8, \ 12800, \ \sqrt[3]{25}, \ \cdot 00625.$$

6. What number must be added to each of the numbers 1, 3, 9 to form an harmonical progression?

7. Find the value of the determinant

$$\begin{vmatrix} 1, & 1, & 1 \\ 1, & 2, & 3 \\ 1, & 4, & 9 \end{vmatrix}$$

8. (i) If x, y, z be any angles, prove that

$$\sin\frac{x-y-z}{2}\sin\frac{y-2}{2}+\sin\frac{x+y-z}{2}\sin\frac{y+z}{2}=\sin\frac{x}{2}\sin y$$

(ii) Also if
$$A+B+C=2m$$
prove that
$$\cos^2 A+\cos^2 B+\cos^2 C=1+2\cos A\cos B\cos C.$$

9. Find expressions for the radii of the inscribed and escribed circle of a given triangle ABC.

Prove that the distances between the centres of the escribed circles are respectively.

$$\frac{a}{\sin\dfrac{A}{2}}\quad\frac{b}{\sin\dfrac{B}{2}}\quad\frac{c}{\sin\dfrac{C}{2}}$$

10. Find an expression for $\tan(A+B+C)$ in terms of $\tan A$, $\tan B$, $\tan C$.

If $$A+B+C=\frac{m}{2}$$

prove that

$$\tan A \tan B + \tan B \tan C + \tan C \tan A = 1.$$

11. Apply De Moivre's theorem to find all the nth roots of unity.

12. Prove that if a be any angle the limit of $\left(\cos\dfrac{a}{n}\right)^n$ is

unity when n increases indefinitely.

SECOND PAPER

Geometry of Solids and Conic Sections
(Nine *questions will obtain full marks*.)

1. If two straight lines neither intersect nor are parallel then

    (*i*) there is one straight line perpendicular to both of them ;

    (*ii*) this common perpendicular is the shortest distance between the given lines.

What will happen if the lines intersect at a finite point or at infinity ?

2. Prove that the volume of a cylinder is three times the volume of a cone having the same base and the same height.

Find the volume of the pyramid formed by cutting off a corner of the cube, whose side is

20 ft., by a plane, which bisects its three edges meeting at one point.

3.   A heavy sphere of 4 ft. radius is placed in a hollow circular cone, whose axis is vertical and vertex downwards. Water is poured over it and fills the hollow space. If the sphere be withdrawn slowly, find the depth through which water will sink. Height of the cone = 6 ft., its radius = 8 ft.

4.   Prove that from any point outside a parabola two tangents can be drawn which will subtend equal angles at the focus.

If the point be taken on the parabola, only one tangent can be drawn ; and no tangent can be drawn from a point inside the parabola.

5.   If the tangent at any point Q of an ellipse meets any diameter CP produced in T, and if QV be the ordinate to that diameter

$$CV.\ CT = CP^2.$$

If a series of ellipses have the same major axis the tangents at the extremities of their latera recta meet at the same point on the minor axis.

6.   The tangents at the extremities of any pair of conjugate diameters meet on the asymptotes, and the line joining the extremities is parallel to one asymptote and bisected by the other ; hence show that the area of the conjugate parallelogram is constant and equal to $4\ CA.\ CB.$

7.   If a rectangular hyperbola circumscribe a triangle it passes through the orthocentre, and conversely.

8. Given the focus, directrix and the eccentricity of a conic, determine any number of points on it and show that the conic will be a closed curve if $e < 1$: it will consist of one or two infinite branches according as $e =$ or > 1.

What happens if $e = 0$?

9. Trace $5x + 3y + 30 = 0$. Show that it represents a straight line. A straight line moves so that the sum of the reciprocals of its intercepts on the two axes is $\frac{4}{15}$, show that it passes through a fixed point.

10. Prove that
$$6x^2 + 5xy - 6y^2 - 48y - 72 = 0$$
represents a pair of straight lines. Draw the lines and find the equations of a pair of straight lines passing through the origin and perpendicular to them.

11. Find the polar equation of a circle, and hence prove that the rectangle contained by the two segments of a chord is equal to the square of the tangent.

The polar equation of the circle on (a, a), (b, B) as diameter is

$$r^2 - r \left\{ a \cos (0 - a) + b \cos (0 - B) \right\} + ab \cos (a - B) = 0.$$

12. Find the equation of a pair of tangents drawn from the point x^1, y^1, to the parabola $y^2 = 4ax$, and prove that the point x^1, y^1, will lie on the directrix if the tangents be at right angles to one another.

15.   Trace the curve $4x^2 + y^2 = 4$. Show that the difference of the eccentric angles at the extremities of its conjugate diameters is a right angle; hence or otherwise prove that the sum of the squares of the semi-conjugate diameters is constant.

FIRST COURSE

(Only FIVE *questions from* A *and* FIVE *questions from* B *to be attempted.)*

A

1.   What length of tubing whose bore is $\frac{3}{5}$ inch and thickness of metal $\frac{1}{10}$ inch can be made from a cubic foot of brass assuming no waste and *taking* $m = \frac{22}{7}$?

2.   If a spherical shell whose outer diameter is 2 inches is found when melted into a solid sphere to be equal in volume to its own cavity, find the thickness of the shell to the thousandth of an inch.

3. O is a given point and P any point on a given circle : find the locus of the middle point of QP.

4.   If the three sides of one triangle are proportional to the three sides of another traingle, prove that two triangles are equiangular.

5. PQR is a triangle having PQ greater than PR; if PS bisecting the angle P meets QR in S and T is the middle point of QR. prove that

$$QT : TS = PQ + PR : PQ - PR.$$

6. Given two similar triangles, construct a third similar triangle equal in area to the difference of the two given triangles.

B

7. Solve the equation.

$$x^4 + 9x^2 + 2 = x(5x^2 + 7)$$

8. If $4ac - b^2$ is positive, prove that $ax^2 + bx + c$ is of the same sign for all real values of x.

9. Find the sum of n terms in Geometrical Progression, having given that the first term is a and the common ratio r.

Also find the eighth term of a Geometrical Progression, having given that the fourth term is 1 and the tenth term is 15625.

10. A box contains 16 balls, of which 5 are red and 11 are of other colours. In how many ways can 10 balls be drawn from the box so that at least 3 of the 10 are always red?

11. In the expansion of $(1 + x)^n$ prove that the co-efficient of the mth term from the beginning is equal to the co-efficient of the mth term the enp

Find the mth term from the beginning in the expansion of $(x - vx)^2n$.

12. Obtain an expansion of ax in a series of ascending powers of x.

MATHEMATICS—1910

FIRST PAPER.

1. Solve the equations :—

(1) $y^2 - 4xy = 0,\ 4x^2 + 15xy = 4\frac{4}{6}$

(2) $\left.\begin{array}{l} x^2 + y^2 + x - y = 22 \\ x + y = 6 \end{array}\right\}$

(3) $x^2 + y = 3,\ x + y^2 = 3.$

2. The highest common factor of $ax^3 + bx^2 + c$ and $ax^2 + bx + d$ is of the first degree in x prove that $ac^2 + bcd + d^3 = 0.$

3. Find the sum of a G. P. of n terms of which the first term is a and common ratio $b.$

Find the value of $1 + 2x + 3x^2 + \&c.$ to infinity where x is less than unity.

4. Define a logarithm. Prove that

$$\log xy + \log x + \log y,$$

and that $\log^b a \times \log^a b = 1.$

Given $\log 2 = 30103$ and $\log 3 = 4712$, find the value of $\log 80$ and $\log 81$. Hence find $\log 8.01.$

5. Prove the Binomial Theorem for a positive *fractional* index. Is your result true without any limitations ?

Find the cube root of 1001 to 4 places of decimals.

6. If a, B are the roots of $x^2 + px + 1 = 0$, prove that the nth term in the expansion of

$\log e\ (x^2 + px + 1)$ is $-\ \dfrac{1}{n}\ (a - n + B - n) \times x^n$.

7. Investigate the formulæ for $\sin(A+B)$ and $\cos(A+B)$ in terms of the sines and cosines of A and B.

Given $\sin A = \dfrac{2n}{n^2 + 1}$, $\sin B = \dfrac{2p}{p^2 + 1}$,

find $\tan(A+B)$.

8. Show that in any triangle the side are proportional to the sines of the opposite angles.

In a triangle $\dfrac{\sin A}{\sin B} = \dfrac{m}{n}$, and $\dfrac{\cos A}{\cos B} = \dfrac{p}{q}$;

show that $\qquad \cos C = \dfrac{mp - nq}{np - mq}$

9. In a triangle where $a = 8$, $b = 7$, $A = 120$, find B and C.

$\log 7 = \cdot 8450980$,   L $\sin 60° \qquad = 9 \cdot 9375306$,
$\log 8 = \cdot 9030900$,   L $\sin 49°\ 16' = 9 \cdot 8795287$,
$\qquad\qquad\qquad$ L $\sin 49°\ 17' = 9 \cdot 8796375$.

10. Enunciate and prove Moivre's Theorem.

If $\qquad\qquad x + \dfrac{1}{x} = 2\cos A$,

prove that $\qquad\qquad x^n + \dfrac{1}{x^n} 2\cos nA$.

SECOND PAPER

Geometry of Solids and Conic Sections
(EIGHT *questions will obtain full marks*)

[N. B.—*You may prove any question geometrically or analytically.*]

If two parallel planes are cut by a third plane, their lines of section with it are parallel.

Prove that intercepts of parallel lines between parallel planes are equal.

2. Prove that the volume of a pyramid
$$= \frac{\text{base} \times \text{height.}}{3}$$

A regular tetrahedron weighs 10·70 maunds, its substance being lead of which the specific gravity is 11·35. Find the length of each edge correct to three figures.

3. If a spherical shell of external diameter 20 centimetres, when formed into a solid sphere be equal in volume to its own cavity, calculate the thickness of the shell to three places of decimals.

4. Trace the line $3x + 4y + 5 = 0$. Reduce it to the form $x \cos a + y \sin a = p$, and show that it touches the circle $x^2 + y^2 = 1$.

5. For what value of y does the equation
$$12x^2 - 10xy + 2y^2 + 11x - 5y + y = 0$$
represent two straight lines? Draw the lines, and find the equation of a pair of straight lines passing through the origin and perpendicular to them.

6. Find the polar equation of a circle, and prove that the rectangle contained by the two segments of a chord drawn from any given point (internal or external) is constant.

7. Show that in a parabola the subtangent to a *diameter* is double of the abscissa.

If the ordinate to a diameter be double of the abscissa, the tangent meets the diameter at a point on the directrix.

8. Trace the parabola $y^2 = 12(x-1)$.

Find the co-ordinates of any point on this parabola and also the equation of the normal passing though this point. How many normals can you draw from any point on the parabola?

9. The normal at any point of an ellipse terminated by either axis varies inversely as the central perpendicular on the tangent.

$(PG.\ PF = CB^2;\ Pg.\ PF = CA^2.)$

10. Define the polar of a point. Find the polar of the point $(1, 1)$ with respect to the ellipse.

$$x^2 + \frac{y^2}{4} = 1.$$

Hence, or otherwise, find the equation of a pair of tangents drawn from the point $(1, 1)$ to the ellipse.

11. The tangents at the extremities of any pair of conjugate diameters of an hyperbola meet on the asymptotes, and the line joining the extremities is parallel to one asymptote and bisected by the other.

12.   The locus of the middle points of a system of parallel chords of *conic* is a straight line, which meets the directrix on the focal perpendicular on the system parallel chords.

In case of a central conic the locus also passes through the centre,

13.   The difference of the eccentric angles of the extremities of a pair of conjugate diameters to an ellipse is a right angle.

Hence, or otherwise prove that the sum of the squares of the semi-conjugate diameters is constant.

[*N.B.*—Special credit will be given for neat and accurate diagrams].

FIRST COURSE

[N. B.—*Only* EIGHT *questions are to be attempted: Two from* Part A, *Two from part* B, *and* FOUR *from part* C. *Special attention should be paid to neat accurate diagrams*].

A

1.   The bisector of the vertical angle of a triangle divides the base in the ratio of the sides.

The base *BC* of a triangle *ABC* is divided internally at *P* and externally at *Q* in the ratio of the sides. Show that the vertex lies on the circle which has *PQ* as diameter.

2.   The areas of similar triangles are as the squares on the corresponding sides.

ABC is a given triangle, construct a similar triangle of double the area.

3. If a straight line is drawn parallel to one side of a triangle the other two sides are divided proportionally.

From a given point P in the side AB of a triangle ABC, draw a straight line to AC produced which shall be bisected by BC.

B

4. Given the area of the surface of a sphere, show how to find its volume.

Find the volume of the portion of a sphere radius 8 inches, comprised between two planes distant 8 in. and 6 in. from the centre (and on the same side of it).

5. Given the radius of the base and the altitude of a cone, find the area of its slant surface.

A circle of 4 inches radius is divided into 4 equal sectors ; if one of these sectors be folded into the form of a cone, determine its volume.

6. The corners of a cube are cut off by planes which pass through the middle points of each set of three conterminous edges. If the edge of the cube was originally 2 ft., find the volume and the surface of the resulting figure.

C

7. Prove that sum of the roots of the equation $x^2 - px + q = 0$ is p.

If the roots of the equation $x^2 - px + q = 0$ are greater than those of the equation $x^2 - qx + p = 0$ by a find the values of p and q.

8. Solve the equations :—

(1) $3x - \sqrt{3x^2 + 7x + 1} = 2$;

$$\left.\begin{array}{l} 2x^2 - xy = 12 \\ 2xy - y^2 = 1 \end{array}\right\}.$$

9. Sum the following series :—

(1) $1 + 3 + 5 + \dots$ to n terms ;

(2) $\dfrac{6}{5} + 1 + \dfrac{5}{6} \dots$ to n terms;

(3) $1 + \dfrac{2}{3} + \dfrac{3}{3^2} + \dfrac{4}{3^3} + \dots$ to infinity.

10. State the Binomial Theorem, and prove it for a positive integral index.

Find the co-efficient of x^n in the expansion of $(1-x)^{-3}$.

11. If 1, a, and a^2 be the cube roots of unity prove that $1 + a + a^2 = 0$.

Find the value of

$$x^4 + 4x^3 + 6x^2 + 4x + 10.$$

when $x = \sqrt{-3} - 1.$

12. Prove that

(1) $\dfrac{e^{ix} + e^{+ix}}{2} = 1 - \dfrac{x^2}{2\,!} + \dfrac{x^4}{4\,!} - \dots$

where $i = \sqrt{-1}$;

(2) $\log(1+x) = x - \dfrac{x^2}{2} + \dfrac{x^3}{3} - \dots$

MATHEMATICS—1911

First Paper.

1. Prove that the roots of the quadratic equation $(x-a)(x-b)=h^2$ are always real.

2. Solve : $$\left.\begin{array}{l} x^4+x^2y^2+y^4=931, \\ x^2-xy+y^2=19. \end{array}\right\}$$

3. Find the $(r+1)$th term in the expansion of $(1+x)^{-4}$.

4. If $a, b, c, d,$ be in G. P. prove that
$$(b-c)^2+(c-a)^2+(d-b)^2=(a-d)^2.$$

5. Write down the expansion of $\log e(1+x)$, in ascending powers of x.

Prove that

$$\log 7 = 1 - \tfrac{1}{2}\log 2 - u\left(\frac{1}{99}+\frac{1}{3(99)^3}+\ldots\right)$$

when the logarithms are taken to the base 10, and u is the logarithms of e to the base 10.

Given that $\log 2 = \cdot 30103$ and $u = \cdot 434294$ find $\log 7$ to six decimal places.

6. Find the value of

$$\begin{vmatrix} 1, & +z, & -y \\ -z, & 1, & +x \\ +y, & -x, & 1 \end{vmatrix}$$

7. If $A+B+C=n$, prove that
$$\sin A+\sin B+\sin C=4\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{e2}$$

8. In any triangle prove that

$$\tan A = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}.$$

9. Prove that the area of a triangle is

$$\frac{2abc}{a+b+c}\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$$

10. By means of De Moivre's theorem find the value of $\tan n\,0$ in terms of $\tan 0$, where n is a positive integer.

SECOND PAPER

(EIGHT *questions will obtain full marks*)

[N. B.—*You may prove any question geometrically or analytically*].

1. Straight lines which are paralled to a given straight lines are parallel to one another. How will the parallel straight lines be represented on a plane (1) parallell to them, (2) perpendicular to them, (3) inclined to them at any angle?

2. Prove that the surface of a sphere is $4\pi a^2$ (a) being the radius of the sphere).

Taking the mean diameter of the earth as 8,000 miles, find the area of the zone included between the latitudes 30° N. and 30° S.

3. Find the volume of the pyramid formed by cutting off a corner of the cube whose volume is 1,213 cubic feet, by a plane which bisects its three conterminous edges.

4. Draw a straight line $y = 2x$, and find the co-ordinates of any two points on it.

The sum of the perpendiculars drawn from four given points on a straight line is constant; prove that the straight line passes through a fixed point.

5. Prove that $2x^2 + 5xy + 2y^2 = 0$ represents a pair of straight lines passing through the origin. Find the angle between the lines.

6. Find the equation of the pair of tangents, and the length of the tangents, drawn from the point $(2, -3)$ to the circle $x^2 + y^2 = 1$.

7. Find the locus of a point which moves in such a way that its distance from a fixed point is equal to its perpendicular distance from a fixed straight line. Trace the curve.

8. The locus of the middle points of any system of parallel chords of a parabola is a straight line parallel to the axis.

The tangents at the extremities of any chord meet on the diameter bisecting the chord.

9. Trace the curve $\dfrac{x^2}{25} + \dfrac{y^2}{9} = 1$.

Find its eccentricity and the distance between the foci.

10. Define the director circle, and show that the tangents to an ellipse which cut at right angles intersect on the director circle.

Prove that in the parabola, the director circle degenerates into the directrix.

11. The difference of the focal distances of any point on a hyperbola is constant, aud equal to the transverse axis.

Given the base of a traingle and its point of contact with the inscribed circle, show that the locus of its vertex is a hyperbola.

12. The portion of any tangent to a hyperbola intercepted between the asymptotes is bisected at the point of contact ; and the area of the triangle formed by the asymptotes and any tangent to the hyperbola is constant.

(*N.B.*—Special credit will be given for neat and accurate diagrams).

MATHEMATICS—1912

FIRST PAPER

[N. B.—*Not more than* EIGHT *questions to be attempted*].

If w is an imaginary cube-root of unity, find the simplest value of the determinant

$$\begin{vmatrix} 1, & w^4, & w^2 \\ w^2, & 2, & w^5 \\ w^7, & w^2, & 3 \end{vmatrix}$$

2. (1) Solve : $x^4 + y^2 = x + y = 2.$

(2) Form the quadratic equation whose roots are the squares of the roots of $x^2 + x + 1 = 10.$

3. Find the nth term of :

(1) $1, 1+\frac{1}{2}, 1+\frac{1}{2}+\frac{1}{4}$, etc.,

(2) $3, \frac{6}{5}, \frac{8}{4}$, etc.,

and the sum of n terms of series (1).

4. Expand $(1-4x)^{\frac{-3}{\wedge 2}}$ in a series of ascending powers of x to *four* terms, and show that the $(r+1)^{th}$ terms of the expansion is

$$\frac{2r+1}{)-(2xr}$$

5. Expand $\log e (1+x)$, where x is less than 1, in series of ascending powers of x.
Prove that

$$\log e \left(\frac{1+3x}{1-2x} \right) = 5x - \frac{5x^2}{2} + \frac{53x^3}{3} - \frac{65x^4}{4} + \text{etc},$$

6.   Prove that

$$\sin (A+B) = \sin A \cos A + \cos A \sin B.$$

Express $\sin (A+B+C)$ in terms of the sines and cosines of A, B and C.

7.   In any triangle ABC, prove that :

(1) $\tan \dfrac{B-C}{2} = \dfrac{b-c}{b+c} \cot \dfrac{A}{2}$

(2) $R = \dfrac{abc}{4S}$

where R is the radius of the circumscribed circle, and S the area of the triangle.

8.   Find the area of a regular polygon of n sides inscribed in a circle of radius r.

If l be perimeter of a regular polygon of n sides, show that its area is equal to

$$\frac{l^2 \cot \dfrac{n}{n}}{4 n}$$

9.   Two sides of a triangle are in the ratio of 9 to 7, and the included angle is $64° 12'$: find the other angles, having given that

$\log 2 = \cdot 3010300$,   L $\tan 57° 54' = 10 \cdot 2025255$,
L $\tan 11° 16' = 9 \cdot 2993216$,
and L $\tan 11° 17' = 9 \cdot 2999804$,

10.   Obtain the exponential values of the sine and cosine of an angle.

Express $\tan (a+iB)$ in the form $A+iB$, where A and B are real quantities.

SECOND PAPER

[N. B.—SEVEN *questions carry full marks*].

1. (1) If two parallel planes are cut by a third plane, their lines of section with it are parallel.

(2) Show that planes which are parallel to the same plane are parallel to one another.

2. Prove that the curved surface of the cone $= \frac{1}{2}$ (circumference of the base) × slant height.

If V and S are the volume and the whole surface of a cone and V, S the volume and the surface of an inscribed sphere prove that

$$V = S$$
$$V' = S'$$

3. Two spheres whose radii are $7\frac{1}{2}$ and $8\frac{1}{4}$ in. respectively, are melted and cast into a hollow shell. If the external diameter of the shell be 3 ft., find the diameter of the internal hollow space.

4. Trace $2x + 3y = 6$. How will you show that it is a straight line? Find the equation of a straight line passing through the origin and parallel to $2x + 3y = 6$.

5. Prove that the following three lines meet at one point, and find the co-ordinates of the common points of intersection:

$3x + 4y + 6 = 0, + 5y + 9 = 0. \quad 3x + 3y + 5 = 0.$

6. Define *Pole* and *Polar*. Find (1) the pole of the straight line $x + 2y + 4 = 0$, and (2) the polar of the point (2, 1), with respect to the circle

$$x2 + y - 2x - 4y = 4.$$

7. Prove that the locus of the foot of the focal perpendicular upon any tangent to a parabola is the tangent at the vertex.

If SY is the perpendicular from the focus S on the tangent at P, prove that $SY^2 = SA \cdot SP$.

8. Show that the difference of the eccentric angles at the extremities of a pair of semi-conjugate diameters of an ellipse is a right angle. Hence or otherwise prove that the sum of the squares of any two conjugate semi-diameters is constant.

9. Trace the hyperbola $3x^2 - y^2 = 4$. Find its eccentricity and the co-ordinates of the foci.

10. Show that the asymptotes are the diagonals of the rectangle formed by perpendiculars to the axes of an hyperbola, drawn through their extremities.

(*N.B.*—You may prove any question either geometrically or analytically).

MATHEMATICS—1913

FIRST PAPER

[N. B.—*Not more than* EIGHT *questions to be attempted*].

1. Find all the roots of the equations :

   (1) $x^5 - 1 = 0$;

   (2) $x^3 + y = y^2 + x = 2.$

2. If the quadratic expression $ax^2 \times bx + c$ vanish for *three* different values of x, show that a, b, c must all vanish.

   Prove that $x + \dfrac{1}{x}$ can not be less than 2, if x is real and positive.

3. Sum to n terms :

   (1) 243, 324, 432, etc.,

   (2) $\dfrac{1}{\sqrt{2}}$, $\dfrac{1}{1 + \sqrt{2}}$, $\dfrac{1}{4 + 3\sqrt{2}}$, &c.

   Insert 10 arithmetic means between 1 and $\frac{1}{16}$, and find the sum of these means.

4. Prove, from first principles, that

$$n+1Cr = {}^n Cr + {}^n Cr - 1$$

nCr denoting the number of combinations of n things taken r at a time ?

   How many diagonals can be drawn to a plane figure of 20 sides.

5. Find the $(r+1)^{th}$ term in the expansion of $(1-x)-\frac{1}{2}$, x being less than unity,

Find the sum of the infinite series

$$1 + \frac{1}{6} + \frac{1 \cdot 4}{6 \cdot 12} + \frac{1 \cdot 4 \cdot 7}{6 \cdot 12 \cdot 18} + \&c.,$$

5. Prove that

$$\log^{10}(n+1) - \log^{10}n$$

6. Prove that

$$= 2u \left\{ \frac{1}{2n+1} + \frac{1}{3} \frac{1}{(n+1)^3} + \frac{1}{5} \frac{1}{(2n+1)^5} + \&c. \right\} =$$

where $u = \log 10e$

Find $\log^{10}2$ to *three* places of decimals, taking $u = 0.43429$.

7. Express $\sin\dfrac{A}{2}$ in terms of $\sin A$. Given that $\sin A = \frac{24}{25}$ and that A lies between 90° and 120°, find the sine of, $\dfrac{A}{2}$

8. Prove that

(1) $\sin^2 A + \sin^2 B + 2 \sin A \sin B \cos (A+B) = \sin^2 (A+B)$;

(2) $\sin 3o = 4 \sin o \sin \left(\dfrac{n}{3} + o \right) \sin \left(\dfrac{n}{3} - o \right)$;

Solve completely $\cos o + \sqrt{3} \sin o = 2$.

9. In a plane triangle ABC prove that :

(1) area $= \sqrt{s(s-a)(s-b)(s-c)}$;

(2) $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

log $6 = 0.778153$, L cos $39° \ 14' = 9.8890644$, difference for $1 = 0.0001032$.

11. Find an expression for the diameter of an escribed circle of a triangle in terms of its sides.

If d^1, d^2 d^3 are the diameters of the escribed circles of a triangle, prove that

$$d^1, d^2 + d^2 \ d^3 + d^3 \ d^1 = (a + b + c)^2.$$

12. (1) Express $1 - \sqrt{-1}$ in the form

$$r(\cos a + i \sin a),$$

and find all the values of its cube-root.

(2) Reduce log $e (1 \sqrt{-1})$ to the form

$$a + b \sqrt{-1},$$

where a and b are real quantities.

SECOND PAPER

[SEVEN questions carry full marks]

N. B.—*You may prove any question either geometrically or analytically).*

1. (1) Prove that a straight line which is perpendicular to each of two given straight lines at their point of intersection is perpendicular to the plane in which they lie.

(2) Prove that, if $ABCD$ is regluar tetrahedron and AE is drawn from A perpendicular to the opposite face BCD, then $AB^2 \ AB^2 = 2 : 3$.

2. (1) Find an expression for the volume of a pyramid, and deduce that of a cone.

(2) A right circular cone is inscribed in a regular tetrahedron so that their verticles coincide and the sides of the base of the tetrahedron touch the circular base of the cone, find the ratio of the volumes of the cone and the tetrahedron.

3. A cylindrical hole of diameter 8 ft. is drilled through a solid sphere of diameter 10 ft., the axis of the cylinder passing through the centre of the sphere. Show that the volume of the remaining portion of the sphere is $36n$ cub. ft.

4. Find the co-ordinates of the points on straight line $3x$ $2y = 5$ which are equidistant from the lines

$$4x + 3y = 7,$$
$$2y - 5 = 0.$$

5. (1) Show that the equation $ax^2 + 2hxy + by^2 = 0$ represents two straight lines. and find the angle between them.

(2) Prove that if the locus

$$x^2 + y^2 + 6xy + 4x + 4y + 2 = 0$$

intercepts on the line $lx + my = 1$ a length which subtends an angle a at the origin, then

$(l^2 + m^2 + 2l + 2m + 1) \tan a = \pm \sqrt{2(l+m=2)}.$

6. (1) Show that the square on the tangent from (x', y') to the circle

$$x^2 + y^2 + 2gx + 2fy + c = 0$$
$$x'^2 + y'^2 + 2gx' + 2fy' + c.$$

(2) A point P moves so that the tangent from P to a fixed circle is equal to its distance from a fixed straight line ; find the locus of the point.

7. Prove that in a parabola the feet to the perpendiculars drawn from the focus on the tangent lie on a straight line

Hence prove that the square of the focal perpendicular on the tangent varies directly as the focal distance of the point of contact.

8. Prove that the sum of the focal distances of any point on an ellipse is constant.

9. (1) Find the locus of the middle points of a system of parallel chords of an ellipse.

(2) If CQ is conjugate to the normal at P, then will CP be conjugate to the normal at Q.

10. (1) Find the equation of the tangent at (x', y') to the hyperbola $a^2 x^2 - b^2 y^2 = 1$.

(2) Find the equation of the tangent at an extremity of the latus rectum of the hyperbola.

$$4x^2 - 9y^2 = 36.$$

MATHEMATICS.—1914

FIRST PAPER

[N. B.—*Not more than* SEVEN *questions to be attempted. All questions are of equal value*].

1. (1) Show that the roots of the equation
$$(x+a)(x+b)=abx^2$$
are always real if a and b are real.

   (2) Solve the equations :—
$$x^2-xy=48y ;$$
$$xy-y^2=3x.$$

2. (1) Sum the series :

   (i) $a+ar+ar^2+\ldots\ldots$ to n terms ;

   (ii) $1+4x+7x^2+10x^3\ldots$ to infinity $(x < 1)$;

   (2) If the roots of the equation
$$(b-c)x^2+(c-a)x+(a-b)=0.$$
are equal, prove that a, b, c are in A. P.

3. (1) If nCr is the number of combinations of n things taken r at a time, show that

$$n\,Cr=\frac{n}{r}\,{}^{n-1}Cr-1$$

   (2) In how many ways can 15 things be made into 3 parcels, each containing 5 things ?

4. (1) Assuming the Binomial Theorem for a positive integral index, prove it when the index is a positive fraction.

   (2) Find in its simplest form the general term of $(1-x)^{-3}$, where $x < 1$.

5. (1) Assuming the expansion of a^x, find the expansion of $\log (1+x)$.

(2) If $x < 1$, sum to infinity

$$\tfrac{1}{2}x^2 + \tfrac{2}{3}x^3 + \tfrac{3}{4}x^4 + \tfrac{4}{5}x^5 \dots$$

6. If in any determinant two columns are identical, prove that the determinant vanishes.
Prove that

$$\begin{vmatrix} 1 & ab+c \\ 1 & bc+a \\ 1 & ca+b \end{vmatrix} = 0.$$

7. Explain what is meant by the circular measure of an angle, and prove that the limit

$$\text{of} \frac{\sin \theta}{\theta}$$

is unity when θ is indefinitely small.
Hence find an approximate value of $\sin 3°$.

8. (1) If $(1-\sin A) (1-\sin B) (1+\sin C)$,
$= (1+\sin A) (1+\sin B) (1+\sin C)$; show
that each $= \cos A \cos B \cos C$.

(2) Solve completely the equation
$\tan \theta + \cot \theta = 4$.

9. Prove that
$\cos (A-B) = \cos A \cos B + \sin A \sin B$,
where A and B are positive acute angles, and
$A > B$ Establish the identities:
(1) $\cos n A \cos (n+2) A - \cos^2 (n+1) A - \sin^2 A = 0$;
(2) $\sin^6 \theta = -3 \sin^2 \theta \cos^2 \theta$.

10. (1) Find the nature of the triangle in which
$\tan A \sin^2 B = \tan B \sin^2 A$.

(2) In a triangle ABC
$b + c = 2a$, $B - C = 90°$.

Find the angle A,

Given $\sin 20° \, 42' = 0\cdot353475$,
$\sin 20° \, 43' = 0\cdot353747$.

11. (1) Prove that in any triangle
$\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$ and $\cos \dfrac{A}{2} = \sqrt{\dfrac{s(s-b)}{bc}}$

where $2s = a + b + c$.

(2) Express the following function
the simplest form in terms of the sides :—

$(b+c) \cos A + (c+a) \cos B + (a+b) \cos C$.

12. (1) Show that the radius of the circum
scribing circle of a triangle depends on one sid
and its opposite angle.

(2) If x, y, z are the distances of the incen
tre from the angular points of a triangle ABC

prove that $\dfrac{xyz}{r} = \dfrac{abc}{s}$

SECOND PAPER

[SEVEN *questions carry full marks*]

{N. B.—*You may prove any question either geo
metrically or analytically*].

1. (1) Planes that are perpendicular to the
same straight line are parallel to one another.

(2) Straight lines that are perpendicular to the same plane are parallel to one another.

2.   Show that the volume of the cone is one-third, and the volume of the hemisphere is two-thirds of the volume of the cylinder having the same base and the same height. (Height in each case is equal to the radius of the base).

3.   A conical hole is drilled in a solid sphere. The vertex of the cone lies on the surface of the sphere and the axis of the cone passes through the centre of the sphere. Find the volume of the portion of the sphere left, the radius of the sphere being 8 inches, and the radius of the base of the cone being 2 inches.

4.   Investigate the condition that the straight lines $ax+by+c=0$ and $a' + x + b' y + c' = 0$ be perpendicular to one another. Find the equation of the straight line through the point $(\frac{3}{4}, -\frac{1}{2})$ perpendicular to the line $2x-4y+5=0$.

5.   A straight line of given length sides between the axes of x and y; show that any point on the line describes an ellipse and the middle point of the line describes circle.

How can this method be used in construction an ellipse having semi-axes equal to 2 and $1\frac{1}{2}$ inches respectively?

6.   How many circles can be described so as to touch three straight lines whose equations are given?

Find the equations of the circles which touch the co-ordinate axes and the line $8x+4y=12$.

7. The tangents at the extremities of a focal chord of a *parabola* intersect at right angles on the directrix, and the line joining the point of intersection and the focus is perpendicular to the focal chord.

8. The sum of the squares of any two conjugate semi-diameters in an *ellipse* is constant.

$$(CP^2 + CD^2 = CA^2 + CB^2).$$

9. The locus of the foot of the perpendicular drawn from either focus upon any tangent to a *hyperbola* is the circle described on the transverse axis as diameter (auxiliary circle); and the rectangle under the focal perpendiculars on the tangent is equal to the square of the semi-conjugate axis.

$$(SY . S'Y' = CB^2).$$

10. Investigate the equation of the hyperbola in the form $4xy = ab$ (i.e., prove that the area of the triangle formed by the asymptotes and any tangent to a hyperbola is constant and equal to ab).

MATHEMATICS.—1915

FIRST PAPER

1. In the quadratic equation $ax^2 + bx + c = 0$, prove that

(1) the sum of the two roots $= -\dfrac{b}{a}$,

and the product of the two roots $= \dfrac{c}{a}$.

(2) If b and c remain finite, and a tends to become infinitely small, discuss the changes in the roots.

2. Solve the simultaneous equations

$x + y + z = 9$, $xy + xz + yz = 23$, $xyz = 15$.

3. Find the sum of an infinite number of terms in Geometrical Progression. What limitation is necessary?

Find the sum of

$$1 - \frac{3}{5} + \frac{5}{5^2} - \frac{7}{5^3} + \frac{9}{5^4} - \ldots$$

to infinity.

4. Prove the Binomial Theorem for a negative integral index.

Find the 6th term in the expansion of $(1 - \frac{2}{5})^{-3}$.

5. How are the logarithms of natural numbers calculated?

Show that

$\log ab = \log a + \log b$, and $\log a^n = n \log a$
for all values of n.

6. Establish geometrically
$\cos (A-B) = \cos A \cos B + \sin A \sin B$.

7. Solve completely the equation
$\tan 3\,0 + \tan 2\,0 + \tan 0 = 0$.

8. Prove that the area of the triangle formed
by joining the centres of the three escribed cir-
cles of a triangle $= \dfrac{abc}{2r}$ where r is the radius of
the inscribed circle.

9. Prove that if two rows of a determinant
be identical, the determinant vanishes.

Find the value of the determinant

$$\begin{vmatrix} 1 & w & w^2 \\ w & w^2 & 1 \\ w^2 & 1 & w \end{vmatrix}$$

where w is the cube root of unity.

SECOND PAPER

[SEVEN *questions carry full marks*].
[N. B.—*You may prove any question either
geometrically or analytically.*]

1. (1) Prove that two straight lines which
are not co-planar possess a common perpendicu-
lar, and that the length of this perpendicular
is the shortest distance between the two lines.

(2) If three points A, B, C on a plane or equidistant from an external point O show that the foot of the perpendicular from O on the plane is the centre of the circle which can be drawn through A, B, C.

2. (1) Prove that the volume of a prism is three·times the volume of a pyramid, both standing on the same base and having the same height.

(2) The base of a pyramid is a square of side $\sqrt{2}$ ft., and its faces are equilateral triangles. Find its volume.

3. (1) Define a solid of revolution. Show that the surface of a sphere is $4\pi r^2$, where r is the radius of the sphere.

(2) A sphere is inscribed in a right circular cone. Prove that their whole surfaces are to one another as their volumes.

4. Find the equation of the straight line passing through the intersection of the lines whose equations are $x-y+1=0$ and $x-2y+4=0$, and perpendicular to the line $9x-3y+1=0$.

5. (1) Find the condition that the two straight lines $ax^2+2hxy+by^2=0$ are at right angles.

(2) Show that the lines joining the origin to the points common to $3x^2+5xy-3y^2+2x+3y=0$ and $3x-2y=1$ are at right angles.

6. Prove that the tangents at the extremities of a focal chord to a parabola meet at right angles on the directrix.

Parallel forces, P, P, P act at the angular points of a right-angled triangle $A B C$, and parallel forces $2P, 2P, 2P$, at the middle points of the sides. If the sides of the triangle including the right angle are 6 and 8 inches respectively, find the distance of the centre of the forces from C the right angle.

4. Give without proof, the conditions of equilibrium of a system of forces in one plane.

A sphere whose radius is 8 inches rests against a smooth vertical wall, being attached to the wall by a string of length 6 inches fastened to a point on the surface of the sphere. The tension of the string is 12 lb. weight. Find the pressure on the wall and the weight of the sphere.

5. Enunciate the laws of friction.

Show that the direction of the least force which will draw a body down a rough inclined plane makes an angle with the plane equal to the limiting angle of friction.

6. Enunciate the principle of virtual work, and apply it to obtain the conditions of equilibrium on the straight lever and the screw.

7. Explain the principle of Atwood's machine.

If, starting from rest, one of the masses falls through 9 ft. in the first 3 seconds, find the ratio of the masses.

8. A particle is projected at an elevation a with velocity v, find the range and time of flight.

MATHEMATICS.—1916
FIRST PAPER.

1. Solve the simultaneous equations :

$x^2 - yz = -5,\ y^2 - xz = 1,\ zx - xy = 7.$

2. Sum the series :

(1) $1 + 3 + 5 + 7 \ldots$ to 20 terms ;

(2) $1 - \dfrac{2}{5} + \dfrac{3}{5^2} + \dfrac{4}{5^3} + \ldots$ to infinity.

3. If A be the Arithmetical, G the Geometrical, and H the Harmonical mean between two numbers a and b, prove that

$$AH = G^2,$$

4. Find the co-efficient of x^{10} in the expansion of

$$\left(x^{-\frac{4}{3}} - \tfrac{2}{3}x^{\frac{2}{5}} \right)^{\frac{3}{5}}.$$

5. Prove that

$\cos (A - B = \cos A \cos B + \sin A \sin B.$

6. Establish the following identities in any triangle :

(1) $c^2 = a^2 + b^2 - 2ab \cos C,$

(2) $\sin \dfrac{A}{2} = \dfrac{(s - b\ (s - c)}{bc}$

7. Prove that $\dfrac{1}{r^1} + \dfrac{1}{r^2} + \dfrac{1}{r^3} = \dfrac{1}{r}$

where $r^1,\ r^2,\ r^3,$ are the radii of three escribed circles, and r the radius of the inscribed circle.

8. Explain. the method of calculating loga-
rithms of numbers to base 10.

9. Solve

$$\sin 3\,0 \times \sin 2\,0 \times\ \sin 0 = 0.$$

SECOND PAPER

[N. B.—*You may prove any question either geo-
metrically or analytically*].

1. When is a straight line said to be perpen-
dicular to a plane ? Draw a perpendicular to a
given plane from a point outside the plane, and
show that there can be only one such straight
line.

2. (1) Straight lines which are parallel to a
given straight line are parallel to one another.

(2) The lines joining the middle points of
the adjacent sides of a *skew* quadrilateral lie in
one plane and from a parallelogram.

3. Give a construction to find a point equally
distant from four points A, B, C, D, which are
not in the same plane.

If $ABCD$ is a regular tetrahedron and O is a
point equally distant from A, B, C, D, prove that

$$OA^2 = \tfrac{3}{8}AB^2$$

4. Find the area of the whole surface of a
right circular cone. Explain why the section of
a right circular cone by a plane perpendicular to
the axis is a circle.

Calculate the surface and volume of the solid
generated by the revolution of a right-angled

triangle about its hypotenuse, the sides containing the right angle being 3 in. and 4. respectively.

5. A straight canal is crossed by two bridges one 3 miles due east of X (a railway station) and the other 4 miles due north. Show that a man who is 8 miles to the east and $1\frac{1}{2}$ miles to the north of X will have to cross the canal to get to the station.

6. Show that the equation $ax^2 + 2hxy + by^2 = 0$ represent a pair of straight lines through the origin. Find the angle between them; also show that the lines are at right angles if $a + b = 0$.

7. Trace the circle $3x^2 + 3y^2 - 6x - 8y - 0$, and find the equation of the tangent at the origin.

8. The subtangent at any point of a parabola is bisected at the vertex; and the subnormal is of constant length.

9. The square of the ordinate of any point on an ellipse varies as the rectangle under the segments of the axis made by the ordinate.

$$(PN^2 : AN.\ A'N = CB^2 : CA^2).$$

Hence find the equation of the ellipse in its simplest from.

10. (1) The normal at any point of a hyperbola terminated by the transverse axis varies inversely perpendicular upon the tangent.

$$(PG.\ PF = CB^9).$$

(2) If in a hyperbola $CA = CB$, prove that its eccentricity $= \sqrt{2}$.

11. Show that the tangent to a hyperbola includes with the asymptotes a triangle of constant area.

THIRD PAPER

1. What is meant by a component of a force?

A vertical force, equal to the weight of 20 lb., has two components, one of which is horizontal and equal to the weight of 10 lb., find the other.

2. Find the centre gravity of a uniform triangular lamina.

If the triangle ABC weigh 6 oz., what weight must be placed at A so that the centre of gravity of the whole may bisect the line joining A to the middle point of BC?

3. State the conditions of equilibrium of a rigid body which is acted on by three forces.

A uniform rod AB rests against a smooth vertical wall AC, and is supported by a string BC. If the inclination of the string to the vertical be 30°, and W be the weight of the rod, find the tension of the string.

Define the *mechanical advantage* of a machine.

Find the relation between the power P and the weight W in a system of five movable pulleys in which each pulley hangs from a fixed block by a separate rope, and the weight of each pulley is equal to P.

5.   State Newton's second law of motion, and deduce the formula $P = m.f.$

A man whose weight is 112 lb. stands on a lift which moves with a uniform acceleration of 12 feet per second ; find the pressure on the floor when the lift is (1) ascending, (2) descending.

6.   How is the *relative* velocity of a body A with respect to a body B determined, when their absolute velocities are known ?

Two particles, A and B, are moving in two straight lines which meet at right angles in C, A approaching C, and B receding from it. Prove that if they are always at the same distance apart, A's velocity must be to B's velocity, at each instant, as CB is to CA at that instant.

7.   A particle is projected with a given velocity in a given direction ; show that its path is a parabola.

With what velocity must a stone be projected horizontally from the top of a tower, 200 feet high, so as to reach a point on the ground 800 feet from the foot of the tower ?

8.   Two balls impinge directly ; find their velocities after impact in terms of the velocities before impact, their masses, and the co-efficient of restitution ; and show that the interchange velocities after collision if their masses are equal and and they are perfectly elastic.

MATHEMATICS—1917

FIRST PAPER

1. Prove that the sum of the cubes of the roots of the equation $x^2 - px + q = 0$ is $p^3 - 3pq$.

If the difference of the roots be unity, prove that $p^2 + 4q^2 = (1 + 2q)^2$.

2. Show how the equations

$$\left.\begin{array}{c} x^2 + y^2 = a \\ (x-y)(x^3 - y^3) = b \end{array}\right\}$$

can be *completely* solved.

Use your method to find the integral roots when $a = 29$, $b = 351$.

3. Find the sum of n term of an arithmetical progression, whose first term is a and common difference b.

The interior angle of a rectilinear figure are in A.P. The least angle is 120° and the common difference 5°. Find the number of sides.

4. Find the greatest term in the expansion of $(1 + x) - n$ when $x = \frac{5}{7}$ and $n = 3$.

5. Show how to expand $\log e (1 + x)$ in powers of x.

Discuss the convergency of the series.

6. Assuming the expansions of $\overline{\cos A + B}$ and $\sin \overline{A+B}$, find the values of $\tan \overline{A+B+C}$, and thence show that if $A + B + C = 180°$.

$\tan A + \tan B + \tan C = \tan A \tan B \tan C$.

7. Find the limiting values of $\dfrac{\sin 0}{0}$ and

$\dfrac{\tan 0}{0}$ when 0 is indefinitely diminished.

8. Calculate the values of sin 18° and cos 18° to two places of decimals.

9. Eliminate 0 from the equations

$$x \cos 0 + y \cos \overline{0 + B} = a$$
$$x \cos 0 - B + y \cos 0 = b$$

10. If r, r^1, r^2, r^3, be the radii of the inscribed and escribed circles of a triangle, prove that

$$\frac{1}{r^1} + \frac{1}{r^2} + \frac{1}{r^3} = \frac{1}{r}$$

___

SECOND PAPER.

[SEVEN *questions carry full marks.*] .

[N. B.—*You may prove any question either geometrically or analytically.*] .

1. (1) In any parabola, prove that

$$P\ N^3 = 4\ \acute{A}\ S.\ {}_1A\ N.$$

(2) If the ordinate of a parabola is equal to the abscissa, then each of them is equal to the latus rectum.

2. Prove that the tangent at the extremity of a diameter of an ellipse is parallel to the chords bisected by the diameter, and that the tangent at an extremity of either axis is perpendicular to the axis.

3. In a hyperbola, prove that the locus of the intersection of tangents which cut at right angles is a circle. When does this locus become imaginary?

4. There are two stations on a straight railway line, one 5 miles due north of a town (X), and another 1 mile to the south and $4\frac{1}{2}$ miles to the east. Find where to build a station at the least possible distance from the town, and determine the distance.

5. Find the equation of the tangents from the point (7, 9) to the circle

$$x^2 + y^2 = 13.$$

6. A string 10 inches long has its extremities at fixed points 8 in. apart. If the string is kept tight by a moving point, find (1) the eccentricity, (2) the latus rectum of the ellipse traced out by the moving point.

7. (1) If two parallel planes be cut by another plane, their common sections with it are parallel.

(2) Prove that, if the faces of a triangular pyramid ABCD be cut by a plane which is parallel to the edges AB and CD, the section is a parallelogram.

8. If two intersecting planes are each perpendicular to a third plane, their line of section is also perpendicular to that plane.

Into how many compartments is space divided by three planes cutting one another at right angles.

9. (1) A sector of a circle of radius 2 feet and vertical angle 60° is wrapped in the form of a right cone ; find its volume.

(2) What portion of the Earth's surface is visible to an observer placed at the centre of the Moon, given that the distance of the Moon's centre from that ·of the Earth is equal to 60 times the Earth's radius.

THIRD PAPER

1. ABCDEF is a regular hexagon. Forces· represented, in magnitude and direction, by AB. AC, AD, AE, and AF, act at A. Find the magnitude and line of action of the resultant.

2. Define the *moment* of a force about a point.

Forces, P, Q, R act on a rigid body along the sides AB, AC, CA of a triangle ABC, and are proportional, respectively, to the lengths of these sides. Show that the sum of their moments about any point in the plane of the triangle is constant.

3. Explain what is meant by the *co-efficient of friction.*

A rough plane is inclined to the horizon at an angle of 60°. Find the magnitude and direction of the least force which will prevent a body weighing 100 lb. from sliding down the plane

(The co-efficient of friction $= \dfrac{1}{\sqrt{3}}.$)

4. What are the requisites of a good common balance

If the beam of a false balance be horizontal when there are no weights in the scale-pans, show that the actual weight of a body is the geometric mean of its apparent weights, when weighed first in one scalepan and then in the other.

5. Prove the formula $s = ut + \frac{1}{2}ft^2$.

A balloon has been ascending vertically from the ground with a uniform velocity for 6 seconds when a stone is dropped from it. It is found to reach the ground in 10 seconds. Find the velocity of the balloon and its height when the stone is dropped.

6. What is meant by the *work done by a force*, and how is it measured ?

The mass of a train is 60 tons, and the resistance to its motion is equal to 20 lb. weight per ton. The locomotive has 240 horse-power. What is the greatest speed with which the train can ascend an incline of 1 in. 280 ?

7. Find the range of a projectile on a horizontal plane.

Find the direction and velocity of projection of a ball that it may pass horizontally just over the top of a wall 75 feet high and 50 yards off.

8. Two smooth spheres, of masses 10 and 15 grammes respectively, moving along the line of their centres, each with a relative velocity of 10 cms. per second with respect to the other, collide. Find, in *ergs*, the loss of kinetic energy due to the collision.

MATHEMATICS—1918

First Paper

1. Solve the equations :—

(a) $\left. \begin{array}{l} x^2 + 2y^2 = 22 \\ 3xy + y2 = 27 \end{array} \right\}$.

(b) $\left. \begin{array}{l} x(y+z) = 44 \\ y(x+z) = 50 \\ z(x+y) = 54 \end{array} \right\}$

2. Find the sum, difference, and product of the roots of the equation $x^2 - 10x + 1 = 0$.

One root of the equation $ax^2 + bx + c = 0$ is three times the other ; prove that

$$3b^2 = 16ac.$$

3. Find the sums of the following series :—

(a) $1 + \cdot 16 + \cdot 027 + \cdot 004629 + \ldots$ to infinity.

(b) $1 - 2x + 3x^2 - 4x^3 + 5x^4 - \ldots \ldots$ to 'n' terms.

4. What is meant by the *sum* of the infinite series ? Prove that the infinite series

$$1 + nx + \frac{n(n-1)}{2}x^2 + \frac{n(n-1)(n-2)}{3}x^3 + \ldots$$

has a finite sum when 'n' is not a positive integer and x is numerically less than 1.

Find $\dfrac{3}{\sqrt{1010}}$ correctly to 3 decimal places.

5. Assuming that

$$a x = 1 + x \log_e a + \frac{x^2}{\lfloor 2} (\log_e a)^2 + \ldots$$

Prove that

$$\log_e (1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots$$

Does the relation hold when $x = 1$?
Prove that

$$\log_e 11 = 2 \log_e 7 - \log_e 3 + \left[\left(\frac{4}{7}\right)^2 + \frac{1}{2}\left(\frac{4}{7}\right)^4 \right.$$

$$\left. + \frac{1}{3}\left(\frac{4}{7}\right)^6 + \dots \text{ to infinity.}\right.$$

6. If $p^2 + q^2 - r^2 + 0$ prove that

$$\frac{1}{p+q+r} + \frac{1}{q+r-p} + \frac{1}{r+p-q} - \frac{1}{p+q-r} = 0.$$

In a right-angled triangle show that the radius of the escribed circle opposite to the right angle is equal to the sum of the radii of the inscribed circle and the other two escribed circles.

7. In a triangle prove the following :—

(i) $\cos\dfrac{A}{2} = \sqrt{\dfrac{s(s-a)}{bc}}$

(ii) $\dfrac{c}{\cot\dfrac{A}{2} + \cot\dfrac{B}{2}} = \dfrac{ab \sin C}{a+b+c}.$

8. If $a = 5$ ft., $b = 8$ ft. and $A = 35$, find in feet and inches the smaller value of C having given

$$\log 2 = \cdot 301030$$
$$L \sin 35^\circ = 9 \cdot 758591$$
$$L \sin 66^\circ 35' = 9 \cdot 962672$$

$$L \sin 66°36' = 9\cdot962727$$
$$L \sin 31°35'42' = 9\cdot719258$$
$$\log 456706 = 5\cdot659637$$

SECOND PAPER

[N.B.—SEVEN *questions carry full marks*].

You may prove any question either geometrically or analytically.

1. (*a*) If a straight line outside a given place is paralled to any straight line drawn on the plane, it is also parallel to the plane itself.

Prove the proposition and its converse.

(*b*) A straight line *PQ* is parallel to each of two intersecting planes, show that it is parallel to their line of intersection.

2. Prove that the volume of the segment o a sphere is

$$\frac{\pi h}{6}(3r_1{}^2 + h^2),$$

when *h* is the height, and r_1 is the radius of the base of the segment.

Deduce the volume of the sphere from thi formula.

Calculate the height of segment, the volum of which is one-quarter of the volume of th whole sphere.

3. A cylindrical hole of 3 in. radius is drille in a sphere whose radius is 5 in., the axis of th

cylindrical hole passing through the centre of the sphere. Find the volume of the sphere left.

4. Find the equation of the line drawn from the point of intersection of the lines $2x - 3y = 0$ and $4x - 5y - 2 = 0$, and at right angles to the line $x + 2y + 1 = 0$.

5. Show that $ax^2 + 2hxy + by^2 = 0$ represents a pair of straight lines passing through the origin.

Find the tangent of the angle between these lines.

5. Prove that in a Parabola, the locus of the middle points of a system of parallel chords is a straight line parallel to the axis.

The figure of a Parabola is traced on paper, determine its focus and directrix.

7. Define eccentric angle of a point on an ellipse. Prove that the difference of the eccentric angles of the extremities of a pair of conjugate diameters is a right angle.

8. The locus of the point of intersection of a pair of tangents to a hyperbola which are at right angle and one another is the director circle.

9. If any line cut a hyperbola, the segments intercepted between the curve and its asymptotes are equal.

Hence or otherwise prove that a tangent terminated by the asymptotes is bisected at the point of contact.

10. Prove that the general form of the equation of a circle is
$$x^2 + y^2 + 2gx + 2fy + c = 0.$$

Find the equation of the circle passing through the points $(25, 0)$—$(7, 24)$, and $(-25, 0)$.

THIRD PAPER

1. If R be the resultant of forces P and Q acting on a particle, and a, B the angles which the directions of R make with those of P, Q respectively, prove that

$$\frac{P}{\sin B} \frac{Q}{\sin a} = \frac{R}{\sin (a+B)}$$

A, B, C, are three points on the cirumference of a circle. Forces

$$\frac{u}{AB} \text{ and } \frac{u}{BC}$$

act along AB and BC respectively. Show that their resultant acts along the tangent to the circle at B.

2. Define a *couple*.

Forces P, Q, R act along the sides AB, BC, CA of a triangle ABC, and are proportional respectively to the lengths of these sides ; prove that they are equivalent to a couple.

3. Find the centre of gravity of uniform triangular lamina.

If ABC be a triangle, and E. F, the middle points of the sides AC, AB, prove that the centre of gravity of the area $CEFB$ divides the line joining the middle points of EF and BC in the ratio of five to four.

4. State the laws of friction.

A uniform rod AB is supported in a horizontal position with its extremity A in contact with a rough wall AC by a string, one end of which is fastend to the rod at a point D, such that $AD = \frac{1}{3} AB$, and the other end to the wall, at the point C. If the length of the string $= \frac{2}{3} AB$. prove that the coefficient of friction between the wall. end rod is

$$\frac{1}{\sqrt{3}}$$

5.   Prove the formula $v_2 = u^2 + 2fs$ in uniformly accelerated motion.

A body starts from rest and describes a distance of 192 feet, with an acceleration of 25 feet per second and afterwards with a retardation of 5 feet per second per second, which brings it to rest exactly on the completion of the distance. Find the greatest velocity acquired.

6.   Find the magnitude of the velocity and direction of motion of a projectile at time t, if it is projected with a velocity U, at an angle a to the horizon. A particle is projected with a velocity of 128 feet per second in direction making an angle of 30 with the horizon. Find when it will move at right angles to the direction of projection.

7.   Two imperfectly elastic spheres impinge directly on each other; determine their velocities after impact.

A football is dropped from a height of 100 feet; find the height to which it rebounds ($e = \frac{3}{4}$).

MATHEMATICS—1919
FIRST PAPER

1. If a and B be the two roots of the equation

$$x^2 + x + 1 = 0,$$

find the value of

$$\frac{1}{a^2} + \frac{1}{B^2}$$

2. Solve the equation
$$x(y+z) = 5.$$
$$y(x+z) = 8.$$
$$z(x+y) = 9.$$

3. If A be the Arithmetical, G be the Geometrical, and H be the Harmonical Mean between a and b, prove that $AH = G^2$.

4. Prove the Binomial theorem for negative index. Find the coefficient of $x7$ in the expansion of

$$\left(\tfrac{1}{2}x^{\frac{1}{2}} - \frac{2}{x^{\frac{1}{2}}}\right)^{-14}$$

5. Expand $\log(1+x)$ in powers of x. Is the expansion valid for all values of x?

Find the value of

$$\frac{1}{2} - \frac{1}{2 \cdot 2^2} + \frac{1}{3 \cdot 2^3} - \frac{1}{4 \cdot 2^5} + \ldots \ldots$$

6. Establish the identities—

$$(a)\ \sin\frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{bc}}$$

(b) $(a+b) \cos (C+b+c) \cos A+(c+a) \cos$
$B=a+b+c$.

7. Solve the equation
$$\sin 3\theta+\sin 2\theta+\sin \theta=0.$$

8. If I_1, I_2, I_3, be the centres of the 3 ascribed circles of the triangle ABC, prove that the area of the triangle $I_1, I_2, I_3, = 2sR$, where R is the radius of the described circle to the triangle ABC.

2. Establish the following identities :—

(a) $\tan (A+B)=\dfrac{\tan A+\tan B}{1-\tan A \tan B}$.

(b) $\tan (45^\circ+A)-\tan (45^\circ-A)=2 \tan 2A$.

SECOND PAPER

Candidates should attempt THREE questions carrying 4 marks, THREE questions carrying 5 marks, and ONE question carrying 6 marks.

Geometrical and analytical methods of proof, singly or in conjunction, will be accepted.

1. OA, OB, OC, are three concurrent straight lines ; OA is perpendicular to each of the two OB and OC ; prove that it is perpendicular to the plane through OB and OC. From O, the orthocentre of a triangle ABC, a straight line is drawn at right angles to the plane ABC ; on this line a point D is taken and DA, DB. DC are drawn to A, B, C. Prove that the directions of any two opposite edges of the tetrahedron $ABCD$ are mutually perpendicular.

2.   Prove that the volume of a tetrahedron is $\frac{1}{3}$ of the volume of a triangular prism on the same base and of height equal to the altitude of the tetrahedron.

Find the radius of the sphere which may be inscribed in a regular tetrahedron the edges of which are of length 'a.'

3.   Find the volume common to two spheres of radii $3''$ and $4''$ respectively whose centres are $5''$ apart.

4.   Prove that the tangent to a parabola at any point P bisects the angle between the focal distance SP and the perpendicular from P to the directrix.

Find the locus of the middle point of the portion of a tangent to a parabola intercepted by the curve and the axis.

5. TP, TP' are tangents from a point T to an ellipse ; if the angle PTP' is right, find the locus of T.

In the above case if TP, TP' meet the auxiliary circle in points HK, H' K' respectively prove that $HK^2 + H'K'^2$ is constant.

6.   In a hyperbola if N, G be the points where the ordinate and normal at P meet the axis respectively, prove that

$$CN : NG = CA^2 : CB^2$$

If the ordinate at B meet the asymptote in K, prove that GK is perpendicular to the asymptote.

7. Find in polar co-ordinates the equation of the circle of radius 'a', which passes through the origin and the diameter of which through the origin make an angle a with the initial line.

Find also the equation to the tangent to this circle at the point where it cuts the initial line.

8. Find the equation to the tangent to the parabola $y^2 = 4ax$ and the co-ordinates of points of contact if the perpendicular distance from the vertex is $\frac{3a}{2}$.

9. Define conjugate diameters of an ellipse; from your definition show that if CD and CP are conjugate semidiameters and PN, DM are ordinates

$$CN^2 + CM^2 = a^2, \quad PN^2 + DM^2 = b^2$$

when a and b are the lengths of the semi-axes.

10. Interpret geometrically the equation

$$x^2 - y^2 = a^2.$$

Write down the equations of the tangent and normal at a point P on the curve.

If PG be the length of the normal and C be the centre, prove that $CP = PG$.

THIRD PAPER

1. State and prove Triangle of Forces.

$ABCD$ is a quadrilateral. Forces acting on a particle are represented in magnitude and direction

by AB, AD, BC and DC. Find the magnitude and direction of their resultant.

2. Find the conditions of equilibrium of a rigid body acted on by three forces.

A heavy uniform bar is suspended by two strings fastened to its ends and to a fixed nail. Show that the tensions of the strings are proportional to their lengths.

3. Define *co-efficient of friction*.

A ladder, 10 feet long, rest with one end against a smooth vertical wall and the other on the ground, the co-efficient of friction being $\frac{1}{2}$. Find to what height from the ground a man, whose weight is four times that of the ladder, may ascend before it begins to slip, the foot of the ladder being 6 feet from the wall.

4. Find the ratio of the power to the weight in the screw, when there is equilibrium.

A weight of 3 tons is raised 6 feet by a screw making 240 revolutions ; find the power, the arm being 2 feet long.

5. State the Second Law of Motion and deduce the formula $P = mf$.

A train of mass 200 tons is urged forward with a force equal to the weight of 1 ton, while it is retarded by a force equal to the weight of 10 lbs. per ton. What is its acceleration, and in what time will it acquire a velocity of 10 miles an hour ?

6.   Find the range of a projectile on horizontal plane passing through its point of projection.

A bomb shell, on striking the ground, bursts, scattering its fragments with velocity U; find the area of ground covered by the fragments, assuming that the shell falls on a horizontal plan.

7.   Prove that, when two bodies impinge, the sum of their momenta along the line of impact is the same after impact as before.

A billiard ball impinges directly on an equal ball at rest ; if the co-effiicient of restitution be e, prove that their velocities after impact are as—$e : 1 + e$.

MATHEMATICS—1920
FIRST PAPER

1. Solve the equations
$$4x^2 + 2xy + y^2 = 7,$$
$$4x^2 + 2xy + y^2 = 3.$$

2. (a) If w be a root of the equation $x^2 + x + 1 = 0$, prove that the other root is w^2.

(b) Find the value of the determinant

$$\begin{vmatrix} 1 & w & w^2 \\ w & w^2 & 1 \\ w^2 & 1 & w \end{vmatrix}$$

where $1, w, w^2$ are the three cube roots of unity.

3. Add the following series :—

(a) $1^2 + 2^2 + 3^2 + \ldots$ to n terms.

(b) $1 + \dfrac{1}{5} + \dfrac{3}{5^2} + \dfrac{5}{5^3} + \dfrac{7}{5^4} + \ldots$ to infinity.

4. Find the greatest term in the expansion of $(2 + 5x)^{10}$ where $x = \frac{1}{3}$.

5. State the exponential theorem. Prove that

$$\text{Log}\,(1 + x) = x - \frac{x^2}{1} + \frac{x^3}{3} - \frac{x^4}{4} + \ldots\ldots$$

Discuss its convergency.

Prove that

(i) $\sin S + \sin T = 2 \sin\dfrac{S+T}{2}\cos\dfrac{S-T}{2}$.

(ii) $\cos\dfrac{A}{2} = \sqrt{\dfrac{S(s-a)}{bc}}$.

7. Establish the following identities :

(a) $\dfrac{\sin 3A + \cos 3A}{\cos A - \sin A} = \sin 2A + 1$,

(b) $\tan A + \tan B + \tan C = \tan A \tan B \tan C$,

where A, B, C are the angles of a triangle.

8. Explain the method of solving a triangle whose two sides a, b, and the angle A opposite to one of the two sides is given.

If B_1, C_1 and B_2, C_2 are the two other angles of two triangles in the ambiguous case, then

$$\dfrac{\sin, C_1}{\sin B_1} + \dfrac{\sin C_2}{\sin B_2} = 2 \cos A$$

9. If r_1, r_2, r_3 be the radii of the three escribed circles, prove that

$$r_2 r_3 + r_3 r_1 + r_1 r_2 = s_2.$$

SECOND PAPER

N.B.—*Two of the first three questions and five of the remaining eight questions should be attempted. Geometrical and analytical methods may be used, alone or in conjunction.*

1. Show how to draw a straight line intersecting and prependicular to each of two straight

lines which neither interesect nor are parallel, and prove that it is the shortest distance between those lines.

Draw the common perpendicular to two opposite edges of a regular tetrahedron and find its length in terms of the length of an edge.

2. Prove that when the slant side of a frustum of a cone is equal to the sum of the radii of the bases

> (1) the height of the frustum is twice the geometric mean of the radii ;
>
> (2) the volume is equal to the total surface multiplied by one-sixth of the height ;

3. Prove that the volume of the part of a sphere intercepted between two parallel planes is equal to the sum of the volumes of a sphere which touches both planes and of a cylinder whose height is the distance between the planes and the area of whose base is half the sum of the areas of the two bounding circles.

4. Draw a tangent to a parabola from an external point.

Two unequal parabolas are placed so as to have the same focus and their axes in opposite directions, prove that they cut orthogonally.

5. If SY, $S'Y'$ be the perpendiculars from the foci of an ellipse to the tangent at P prove that

$$SY.\ S'Y' = BC^2$$

where BC is the minor semi-axes.

If PG be the normal at P and G be on the major axis, prove that PG is a harmonic mean between SY and $S'Y'$.

6. From a point P on a hyperbola PK, PL are drawn parallel to the asymptotes. Prove that $PK \cdot PL$ is constant.

Two straight lines intersect at C at an angle of 120°. P is a point lying within the obtuse angle such that CP makes an angle of 30° with one line and $CP = c$. Find the focus and eccentricity of the hyperbola which passes through P and has these two lines as asymptotes.

7. The polar co-ordinates of two points A, B are $r_1 0_1$ and $r_2 0_2$. Find the polar co-ordinates of the points where the internal and the external bisectors of the angle AOB meet the line AB, O being the pole.

8. Prove that the figure bounded by the four straight lines :

$$2x - y + 3 = 0 \qquad x + 2y - 1 = 0$$
$$2x - y - 6 = 0 \qquad x + 2y + 2 = 0$$

is a rectangle and obtain the equations of its diagonals.

9. What geometric or other property would you make use of in investigating whether two circles whose equations are given touch each other or not ?

Prove that the circles

$$x^2 + y^2 - 12x - 3y - 18 = 0$$
$$x^2 + y^2 + 4x + 9y + 18 = 0$$

touch each other ; write down the equation of the tangent at the point of contact.

10.   Find the equation to the normal to a parabola in terms of the tangent (m) of the angle which it makes with OX.

Find the equation to the locus of the middle point of the normal PG at P, where G is on the axis.

11.   In a central conic prove that the locus of the middle points of parallel chords is a diameter and that the tangent at the extremity of this diameter is parallel to the system of chords.

THIRD PAPER

N.B.—SEVEN *questions, of which the first should be one, to be attempted.*

1.   State the Parallelogram of Forces. Prove that the forces, acting on a particle and reperesented by the medians AD, BE, CF of a triangle ABC, are in equilibrium.

2.   Define the *centre* of parallel forces and shew how to find its position.

Like parallel forces act at the vertices A, B, C of a triangle, and are proportional to the lengths of the sides BC, AC, AB respectively. Prove that the incentre of the triangle is the centre of the forces.

3.   State the necessary and sufficient conditions of equilibrium of coplanar forces acting on a rigid body.

A uniform square board, *ABCD*, is capable of motion in a vertical plane about a hinge at *A*, and a weight half that of the square is suspended from the adjacent angular point *B* Find the angle that the diagonal of the board through *A* makes with the vertical, in the position of equilibrium.

4. Define the *centre of gravity* of a body and shew that it cannot have more than one centre of gravity.

A triangular lamina *ABC* is suspended from the vertex *C* ; find the inclination of *AB* to the horizon, if $CA : AB : BC = 1 : 2 : \sqrt{3}$.

5.   Define power.

If a cyclist always works with $\frac{1}{10}$ H.P. and goes 12 miles per hour on the level, shew that the resistance of the road is 3·125 lbs. weight. If the mass of the machine and its rider be 12 stone prove that, up an incline of 1 in 50 the speed will be reduced to about 5·8 miles per hour.

6. Prove the formula $s = ut + \frac{1}{2}ft^2$ for uniformly accelerated motion.

A falling particle, in the last second of its fall passes through 224 ft. Find the height from which it fell, the acceleration due to gravity being 32 ft. per sec. per sec.

7.   Two bodies of masses *m* and *m'* are connected by a light string which passes over a fixed smooth pulley and the bodies hang freely. Find the acceleration of each mass and the tension of the string.

If the string cannot support a tension greater than one quarter of the sum of the weights at its ends, shew that the larger weight cannot be much less than six times the smaller and that the least possible acceleration is $\frac{1}{2} g \sqrt{2}$.

8.   Shew how to find the relative velocity of two moving particles.

Find the relative velocity of the two extremities of the hands of a clock of lengths one foot and 9 inches respectively, at 3 o'clock,

$$\left(n = \frac{22}{7} \right).$$

9.   Prove that the velocity of a projectile at any point of its path is that due to a fall from the directrix. If v^1 and v^2 be the velocities of a projectile at the ends of a focal chord of its path v_0 and velocity at its vertex, prove that

$$\frac{1}{v_1^{\,2}} + \frac{1}{v_2^{\,2}} = \frac{1}{v_0^{\,2}}.$$

10.   Define Kinetic Energy.

Two smooth spheres, of masses m and m', moving with velocities u and u' in opposite directions, collide directly. If e be the co-efficient of elasticity, find an expression for the loss of kinetic energy.

MATHEMATICS.—1921.

FIRST PAPER.

1. Solve the equations :—
$$y^2 + yz + z^2 = 7$$
$$z^2 + xz + x^2 = 13$$
$$x^2 + xy + y^2 = 19.$$

2. (a) If a and B be the two roots of the equation

$$x^2 + x + 1 = 0,$$

find an equation whose roots are a^2 and B^2.

(b) If the two roots of a quadratic equation be such that each of them is the square of the other, prove that each of them is a cube root of unity.

3. (a) The sum of three consecutive terms in A. P. is 51, and the product of the two extreme terms is 273. Find the terms.

(b) Add the series $1 + 3 + 6 + 10 + 15$ to 20 terms.

4. Assuming the Binomial Theorem, obtain the expansion to 4 terms the nth term of

$$(a + bx) - \frac{p}{q} \text{ where } a > bx$$

Find the 10th term in the expansion of

$$\frac{3}{\left(\frac{2}{3} = \frac{3}{2}x\right)^{\frac{1}{2}}} \text{ where } -\frac{4}{9} < X < \frac{4}{9}.$$

5. Establish the following identities for a plane triangle :—

(i) $\dfrac{\sin A}{a} = \dfrac{\sin B}{b} = \dfrac{\sin C}{c}$,

(ii) $\dfrac{\cos A}{a} + \dfrac{\cos B}{b} + \dfrac{\cos C}{c} = \dfrac{a^2 + b^2 + c^2}{2abc}$.

6. Solve the equation :—

$$\tan 3\,\theta + \tan 2\,\theta + \tan \theta = 0.$$

7. Prove the following identities :—

(i) $\sin 3A = 3 \sin A - 4 \sin^3 A$,

(ii) $\sin^2 (A + B) - \sin^2 (A - B) = \sin 2A . \sin 2B$.

8. If r, and R denote the radii of the inscribed and circumscribed circles of a triangle whose sides are a, b, and c, show that

$$\frac{1}{bc} + \frac{1}{ca} + \frac{1}{ab} = \frac{1}{2rR}.$$

SECOND PAPER.

[SEVEN questions, which should include Nos. 1 and 2 to be answered.]

1. If two planes are each perpendicular to a third plane, prove that their line of intersection is perpendicular to that plane. Through points B, C on two intersecting lines AB, AC pass two planes perpendicular to AB and AC respectively ; prove that the line of intersection of these planes is perpendicular to the plane ABC.

2. Find the volume of a frustum of a cone, the height of the frustum being 'h,' and the radii of the plane ends being 'a' and 'b' respectively.   —

A chimney of solid brickwork is 120 feet high, the radii of the base being 12 feet external, 9 feet internal, and the radii at the top 6 feet external and 5 feet internal : calculate the volume of the material used in building.

√3. The length and breadth of a bungalow are 60 feet and 30 feet respectively, and the roof slopes up from each wall at an angle of 30 to the horizontal ; find the height of the ridge of the roof above the top of the walls, and the whole area of the roof.

4. Find an expression for the length of the perpendicular from the point $x_1 y_1$ to the straight line $ax+by+c=0$, explaining the ambiguity of sign.

Find the co-ordinates of the centre and the radius of the circle inscribed in the triangle the equations of whose sides are $x=3, y=4, 4x+3y=12$.

Draw an illustrative diagram.

5. Obtain the equation of the tangent to the parabola $y^2 =4ax$ which makes an angle $\tan^{-1} m$ with OX.

Write down the equation of the tangent perpendicular to this tangent and find the locus of the intersection of perpendicular tangents.

Interpret the result geometrically.

6. On the major axis of an ellipse (semi-axes ' a ' and ' b') as diameter a circle is described ; prove that the intercepts on a line perpendicular to the major axis made by the circle and the ellipse respectively are in a constant ratio.

Define and interpret geometrically the term " eccentric angle."

Find the locus of the middle point of the chord joining two points on the ellipse whose eccentric angles differ by a constant angle ($2a$).

7. In a parabola if QQ' be a chord through the focus S parallel to the tangent at the point P of the parabola, prove that $QQ' = 4SP$.

Hence if a parabola and its axis be drawn and its focus marked upon paper, give a ruler-and-compasses construction to draw a focal chord of given length.

How many may be drawn, and what is the least possible length of the chord ?

8. Find the locus of the point of intersection of perpendicular tangents to a given ellipse.

An ellipse whose axes are given in length moves so as always to touch two fixed perpendicular lines. Find the locus of its centre.

9. A straight line intersects one branch of a hyperbola and its asymptotes ; prove that the parts intercepted between the curve and the asymptotes are equal. Prove that the point where the normal

at *P* meets the axis is equidistant from the points where the tangent at *P* to the hyperbola meets the asymptotes.

THIRD PAPER.

[*N.B.*—SEVEN questions, of which the first must be one, are to be attempted.]

1.   What is meant by the *resultant* of a system of forces ?

ABCDEF is a regular hexagon. Find the resultant of the forces acting at *A* and represented, in direction and magnitude, by *AB*, 2*AC*, 3*AD*, 2*AE* and *AF*.

2.   Find the centre of gravity of a quadrilateral lamina having two parallel sides.

3.   Define the *moment* of a force about a point, and shew that the algebraic sum of the moments of a system of coplanar forces about any point in their plane = the moment of their resultant about it.

A uniform beam, 4 feet long, is supported in a horizontal position by two props which are 3 feet apart, so that the beam projects one foot beyond one of the props ; prove that the pressure on one prop is double the pressure on the other.

4.   State the laws of friction

A uniform rod *AB*, 6 feet long is just supported in a horizontal position, with its extremity *A* in contact with a rough wall *AC*, by a string *CD*, one

end of which is attached to a point D of the rod and the other end to a point C on the wall, If $AD = 2$ feet and $CD = 4$ feet, prove that the coefficient of friction at $A = \dfrac{1}{\sqrt{3}}$.

5. Describe the common steelyard and explain how it is graduated.

The weight of a steel yard is 10 lbs., and the point of suspension of the body to be weighed and the centre of gravity of the beam are on the same side of the fulcrum and are 4 and 3 inches respectively from it. If the movable weight be 12 lbs., find the zero-point and the point indicating 56 lbs.

6. A body is projected vertically upwards with a given velocity u, find the greatest height to which it rises.

A and B are projected vertically upwards at the same instant with velocities of 25 feet and 200 feet per second respectively. A from the top and B from the bottom of a vertical cliff, 300 feet high. Find where they will meet and the directions of their motion at the time of meeting. $(g = 32)$.

7. State Newton's laws of motion.

A board weighing 2 lbs. is pulled along a rough horizontal table $(u = \cdot 2)$ by a string which passes over a pully at the edge and supports a weight of $\frac{1}{2}$ lb. Find how far the board will move in 1 second, and also the tension of the string. $(g = 32)$.

8. Explain the terms Work and Energy (kinetic and potential) and state the units which are ordinarily used to measure them. A body weighing 80 lbs. falls from a height of 30 feet into some sand. Assuming the retarding force of the sand to be constant, find its magnitude if the body penetrates 4 feet before coming to rest.

9. Find the range of a projectile on the horizontal plane through the point of projection, the velocity and direction of projection being given.

A man standing 100 feet from a wall whose height is 50 feet throws a cricket ball, which just clears the wall and reaches the ground 100 feet beyond it. Find the direction in projection of the ball.

10. A smooth sphere, of mass m, is dropped from a height h on a smooth fixed horizontal plane ; find the height to which it rebounds, the coefficient of restitution being e.

A glass marble is dropped from the ceiling of a room, and after rebounding twice from the floor, reaches a height equal to half that of the room. Find the coefficient of restitution, and the whole distance described by the marble before it has finished rebounding.

MATHEMATICS.—1922

FIRST PAPER.

1. Solve the equations

$(a+c)(ax^2+cy^2)-2\,acxy=(a+c)^2\,(a^2+c^2)$
$x^2+y^2=2\,(a^2+c^2).$

2. In how many ways may 10 rupees be divided among 4 persons so that no person shall receive less than 3 rupees?

3. (a) Show that

$$1+\frac{2^2}{1!}+\frac{3^2}{2!}+\frac{4^2}{3!}+\cdots+\frac{(n+1)^2}{n!}+\cdots\text{to infinity}=5e.$$

(b) In an infinite geometric series, each term is equal to three times the sum of all the terms which follow it, and the sum of the first two terms is 15. Find the sum to infinity of the series.

4. Prove the rule which determines the characteristic of the logarithm (to base 10) of a number less than unity.

Find the smallest integral power of 7 which is greater than 10^{50}. (log $7=·8451$).

5. Solve the equation

$3\sin 2\,\theta+4\cos 2\,\theta=2\,(1+\cos^2\theta)$

and specify the number of roots between $\dfrac{\pi}{2}$ and 2π.

6. (i) Prove that

$$2 \tan^{-1} \tfrac{1}{2} + \cos^{-1} \frac{4}{5} = \frac{\pi}{2}.$$

  (ii) Eliminate e from the equations

$$x = \sin 2\theta - 2 \sin \theta$$
$$y = \tfrac{1}{2} \operatorname{cosec} \hat{\theta}$$

7. The area of a triangle is 6 square feet; the product of the three sides is 60 cubic feet; and one of the altitudes is $2\frac{2}{5}$ feet. Determine the character of the triangle, and show that its perimeter is 12 feet.

8. Obtain an expression for the radius of an escribed circle of a triangle, and prove that the sides, of the triangle whose vertices are the centres of the escribed circles are

$$\frac{a}{\sin\dfrac{A}{2}} \quad \frac{b}{\sin\dfrac{B}{2}}, \text{ and } \quad \frac{c}{\sin\dfrac{C}{2}}$$

SECOND PAPER.

[*N.B.*— Questions 2 and 7, and any FIVE of the remaining eight are to be answered.]

1. If a straight line is perpendicular to each of two intersecting straight lines, their point of intersection, prove that it is perpendicular to the plane containing them.

ABC is a right-angled triangle, C being the right angle. If S is a point in space such that

$$SA = SB = SC.$$

prove that the line joining S to the middle point of AB is perpendicular to the plane of the triangle ABC.

2. Find the volume of a regular tetrahedron, the length of each edge of which is $2a$, and also the shortest distance between any pair of its non-intersecting edges.

3. Prove that the volume of a sphere of radius a is $\frac{4}{3}\Pi a^3$. Find the volume of the largest sphere that can be cut out of a right circular cone whose semi-vertical angle is 30° and height 10 inches.

4. Prove that the circle drawn through the points of intersection of any three tangents to a parabola passes also through its focus. Given four tangents to a parabola, find its focus.

5. If PG be the normal at any point P of an ellipse, meeting the major axis in G and S and S the foci, prove that PG bisects the angle SPS' and that $SG : SP = c$.

If the normal PG meets the minor axis in g and the tangent at P in t, show that the five points P, S, S, g and t are concyclic.

6. Define an equilateral hyperbola and find its eccentricity A, B, C are three points on an equilateral hyperbola ; prove that the ortho-centre of the triangle ABC is also a point on it.

7. Find the equations of the perpendiculars from the vertices on the opposite sides of the triangle formed by the lines

$x - 2y + 2 = 0$, $2x - y - 2 = 0$ and $x + y + 2 = 0$,
and shew that they are concurrent.

8. Find the equation of the *polar* of a point with respect to the circle $x^2 + y^2 - a^2 = 0$. If the portion of the polar between its points of intersection with the circle subtends a right angle at the centre, find the locus of the *pole*.

9. Find the equations of the tangent to the ellipse
$$x^2/a^2 + y^2/b^2 = 1$$
at the point (v', y') on it.

If the tangent at any point P on an ellipse meets the major axis in T, and if PN is the ordinate of P, prove that $CN. \quad CT = CA^3$.

10. Find the polar equation of a circle, the pole being a point on the circumference. Prove that the circles $r = a$ as $(0 - a)$ and $r = b$ sin $(0 - a$ cut at right angles.

Third Paper

[*N.B.*—Question 6 and six other questions should bean swered.]

An additional half-mark to each may be given for diagrams and neatness in answers to the optional questions.

1. Write down the conditions necessary for a body acted on by three forces to be in equilibrium.

A uniform rod, 4′ long, is free to turn in a vertical plane about its upper end which is hinged. To a point of the rod 3′ from the hinge is attached a string which passes over a pulley and supports a weight P. The rod is in equilibrium at an angle of $60°$ to the horizontal and the string is perpendicular to the rod. Prove that P is one-third of the weight of the rod and that the reaction at the hinge makes an angle

$$\tan^{-1}\left(\frac{5\sqrt{3}}{3}\right)$$

with the horizontal

2. Prove that the algebraic sum of the moments of two concurrent forces about a point within the angle between the two forces is equal to the moment of their resultant.

Three forces are represented in magnitude, sense, and line of action by AB, $\frac{1}{2}BC$, and CA Find their resultant (magnitude, sense and line of action) illustrating by a diagram.

3. Find the centre of gravity of a thin triangular plate of uniform thickness.

The top part of an isosceles triangle is removed by cutting it along a line parallel to the base through the mid point of the perpendicular from the vertex to the base. If the length of the perpendicular was originally $8''$, find the distance from the base of the $c\,g.$ of the remainder.

c

4. Describe the system of pulleys in which a single cord passes round all the pulleys and find the relation between the power and the weight supported, taking into account the weight of the pulleys.

In such a system it is found that a weight of 5 lbs. will support a weight of 19 lbs, and a weight 10 lbs. will support a weight of 44 lbs.   Find the number of pulleys and the force required to support a weight of $51\frac{1}{2}$ lbs.

5. State the laws of friction.

Find the force which is just on the point of dragging a weight W (1) up, (2) down a plane of inclination a to the horizontal, where a is less than the angle of friction and in both cases the force is parallel to the plane. Find the ratio of the height of the plane to its length, and the co-efficient of friction if, when $W = 13$ lbs. the necessary forces are 14 lbs. and 4 lbs. respectively.

6. Given u the initial velocity, f the uniform retardation, t the time, and s the distance traversed, carefully prove the formula

$$S = ut - \tfrac{1}{2}ft^2.$$

7. A stone thrown vertically upwards passes a certain point t_1 seconds after projection and after a *further* t_2 seconds strikes the ground again ; prove that the height of this point of projection is $16\,t_1\,t_2$ feet ; prove also that the stone passes a point midway between this point and the point of projection with a velocity

$$16\sqrt{t_1{}^2 + t_2{}^2}\,t$$

per second.

8. Define " Impulse," Two bodies moving in the same straight line collide ; prove that the total momentum is unchanged.

Two balls of masses 2 and 3 lbs. are moving with velocities 6 ft. per second and 3 ft. per second respectively in the same direction in the same straight line ; after the impact the velocity of the larger ball is 5 ft. per second ; find the co-efficient of restitution, and the number of foot-pounds of kinetic energy lost in the impact.

9. Obtain a formula for the distance from the point of projection, after t secs. of a heavy body projected at an angle a to the horizontal with velocity u ft. per second. A body projected with velocity u ft. per second and elevation a, is after t secs. at a distance ut feet from the point of projection ; prove that it reached the highest point of its path $\frac{1}{4}t$ secs., after projection.

10. What units are used for the measurement of Work and of Kinetic Energy ? In the case of a body acted on by forces state any relation between the kinetic energy of the body and the work done by the forces.

An engine raises 1,200 gallons of water a minute to a height of 6 feet and discharges it with a velocity of 32 feet per sec. ; at what H. P. is the engine working ? (One gallon of water weighs 10 lbs.)

MATHEMATICS.—1923

FIRST PAPER.

Time—Three hours.

[*Question five and* SIX *other questions should be answered.*]

1. Solve the equations—

$$x + z = 0,$$
$$x^2 - 2xz + xy = 5,$$
$$y^2 + yz = 2.$$

2. If the roots of the quadratic equation

$$ax^2 + bx + c = 0$$

are such that their sum is equal to the sum of their squares, shew that $2ac = ab \times b^2$. If also one of the roots is unity, find the other.

3. Establish the binomial theorem for a positive integral index.

Obtain the term which does not contain x in the expansion of $\left(x^2 + \dfrac{1}{x} \right)^{3n}$

4. (a) Show that

$$\left(2^n + \frac{1}{2^n} \right) + \left(2^{n-1} + \frac{1}{2^{n-1}} \right) + \dots + \left(2 + \frac{1}{2} \right)$$
$$+ 1 = 2^{n+1} - \frac{1}{2^n}.$$

(b) Prove that

$$\log ab = \log a + \log b.$$

5.   Give a geometrical proof of the relation

$$\sin (A-B) = \sin A \cos B - \cos A \sin B$$

where A and B are acute.

6.   In any triangle prove the following relations :—

(i) $\tan A + \tan B + \tan C = \tan A \tan B \tan C$.

(ii) $\tan \dfrac{A-B}{2} = \dfrac{a-b}{a+b} \cot \dfrac{C}{2}$

7.   Solve the following equations :—

(a) $\cos^2 x + 2 \sin x \cos x - \sin^2 x = 1$,

(b) $\cos 3x + \cos 2x + \cos x = 0$.

8.   If I be the incentre, I_1, I_2, and I_3, the centres of the escribed circles, and R the circum-radius of the triangle ABC, prove that

$$\frac{II_1}{\sin \dfrac{A}{2}} = \frac{II_2}{\sin \dfrac{B}{2}} = \frac{II_3}{\sin \dfrac{C}{2}} = 4R.$$

SECOND PAPER.

Time—Three hours.

Seven *questions including No. 4, should be answered.*

1.   Define a *solid* angle. Shew that in a trihedral angle the sum of any two of the face-angles is greater than the third.

17

D is a point outside the plane of the triangle ABC; prove that the sum of the angles of the quadrilateral $ABCD$ is less than four right angles.

2. Prove that the volume of a sperical segment is

$$\frac{\overline{\Pi}h}{6}\left(3a^2 + h^2\right),$$

where a is the radius of the base, and h the height, of the segment.

A thin globe, of radius 5 in., rests on a circular ring, of radius 4 in., whose plane is horizontal. Find the ratio of the volumes of the two portions of the sphere, which are respectively above and below the plane of the ring.

3. How many square yards of canvas are required to make a conical tent, 9 ft. high, such that a man, 6 ft. high, could just stand without stooping at a distance of 2 ft. from centre $(\overline{\Pi} = 3\cdot1416)$?

4. Prove that the tangents at the ends of a focal of a parabola intersect at right angles on the directrix.

5. Find the locus of the foot of the perpendicular from a focus on any tangent to an ellipse. If the diameter DCD' of an ellipse, drawn parallel to the tangent at any point P on it, meet SP, $S'P$ in E, E', prove that $PE = PE' = AC$.

6. The chord of a hyperbola, drawn parallel to its conjugate axis through any point P on the curve,

meets the asymptotes in q and q'. Prove that Pq, $Pq' = BC2$.

Hence, or otherwise, prove that, if a, B be the co-ordinates of any point of a hyperbola, referred to its asymptotes as axes,

$$aB = \tfrac{1}{4}(a2 + b^2),$$

a and b being the lengths of the semi-axes of the curve.

7. Find the equations of the medians of the triangle, whose vertices are (a_1, b_1), $(a_2. b_2)$, (a_3, b_3), and shew that they are concurrent.

8. Define the *radical axis* of a pair of circles, and shew how to find its equation.

Find the co-ordinates of the point on the line $x + y - 1 = 0$, the lengths of the tangents from which to the circles

$$4(x_2 + y^2) - 4(3x + 2y) + 9 = 0$$
and $\qquad 2(x^2 + y^2) - 2(x + y) + 1 = 0$
are equal.

9. Shew that the focal distances of any point (x', y') on the hyperbola

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

are $ex' + a$ and $ex' - a$.

Prove that the distance from the centre of any point on an equilateral hyperbola is a mean proportional between its distances from the foci.

THIRD PAPER.

Time—Three hours.

The first *and* six *other questions should be answered.*

1. Write down, in their simplest forms, the conditions necessary for a body, acted on by three forces, to be in equilibrium.

A weight of 25 lbs. is hung, by two strings of lengths 2 ft. and 1 ft. 6 ins. respectively, from two nails in the same horizontal line 2 ft. 6 ins. apart. Find, by drawing a triangle of forces, the tensions in the strings.

2. Define 'centre of gravity,' and, in the case of a suspended body, prove that the centre of gravity is vertically below the point of support.

A long uniform rod is bent so as to form three sides of a square. Find the points in the sides at which it may be suspended so that the three sides may be inclined at equal angles to the horizontal.

3. Define the moment of a force about a point and prove that the algebraic sum of the moments of any number of co-planar parallel forces about a point in their plane, is equal to the moment of their resultant.

Masses 2, 3, 4 and 5 lbs. are fastened to the rim of a wheel at points symmetrically arranged round the circumferences. A string, coiled round the circumference, supports a weight $\sqrt{2}$ lbs. If the

wheel is free to rotate in a vertical plane about its centre, prove that, in the position of equilibrium, the radius to the first weight is inclined at 15° to the horizontal.

4. Explain the term 'coefficient of friction.'

A mass of 6 lbs. rests upon a rough plank AB which is hinged at A. A string attached to the mass passes over a pulley at B and supports a mass of 3 lbs. When the plank is horizontal, the masses are on the point of motion. The plank is tilted up until motion is again about to take place. Prove that the inclination of the plank to the horizontal is

$$\tan^{-1}\left(\frac{4}{3}\right).$$

5. The lower block of a system of pulleys contains one pulley and supports a cage, the weight of cage and block being W. The upper block contains two pulleys. A man of weight w stands in the cage and supports himself by pulling on the end of the rope which passes round the pulleys. What force does he exert ?

Show that $w \ X \dfrac{W}{3}$

6. In the case of rectilinear motion under uniform acceleration derive the formula $v^2 = u^2 + 2fs$. A, B, C are three points in a straight line ; $AB = BC = 12$ ft. A body passes A, B, C with velocities 6.8, 5.2, 2.8 ft. per sec. respectively. Is this consistent with uniform acceleration ? How much farther will the body travel before coming to rest ?

7. Given the velocity and the angle of projection of a projectile, find its range on a plane of given inclination passing through the point of projection, the motion being in a vertical plane perpendicular to the inclined plane.

The velocity of projection is 80 ft. per sec.; the inclination of the plane to the horizontal is 30° : find the maximum ranges up and down the plane respectively.

8. Define 'power' and state how it is measured.

What H. P. is required to drive a motor-lorry, weighing 3½ tons, at 12 miles per hr. over a level road, the resisting forces (due to air and road-resistance) being 45 lbs. per ton ?

What are Newton's Laws of Impact ?

A ball is projected vertically upwards with velocity 80 ft./sec. When it is at its highest point a second equal ball is projected vertically with the same velocity. Find where they will collide, and, if e = ·6, find when the second ball will reach the ground.

Intermediate Examination Papers, 1909

PHYSICS

FIRST PAPER

(Not more than TWO questions, from A, and THREE from each of the sections B, C, D, are to be attempted).

A

1. What are beats ? Why are they produced ? Illustrate your answer by an arithmetical calculation.

2. What is resonance ? Illustrate by describing experiments.

3. What are nodes ? Describe some experiments to illustrate their presence.

B

4. What are isothermal and adiabatic curves ? State their equations for gases in p v co-ordinates. Prove that the elasticity of a gas at constant temperature is equal to the pressure.

5. Describe in detail how (a) the latent heat of steam, or (b) the coefficient of expansion of solids or liquids, can be determined.

6. Describe Joule's experiments on the relation between heat and work.

7. What is meant by saying the humidity of the air is 60? How would you determine the humidity of the air ?

C

8. State and prove the law of conjugate images for a concave mirror.

A lighted candle is held at a distance of one yard from a wall, and an image of the flame is projected on the wall by means of a concave mirror. The size of the image is twice that of the flame. Find the position and focal length of the mirror.

9. Compare a ray (or wave) of plane polarised light with a ray (or wave) of sound. How would you produce a beam of plane polarised light, and how would you test whether a given beam was plane polarised?

10. How would you produce a pure spectrum? Explain the existence of Fraunhofer's lines.

11. Describe the construction and use of the sextant.

D

12. How would you determine the magnetic dip?

13. Calculate the force on a magnetic pole, placed at some distance from a straight thin bar magnet, in a straight line with it. Calculate further the approximate value of this force in a simpler form, (a) when the pole is very near, and (b) when it is very far from the magnet.

14. Describe some form of Wheatstone's Bridge, and explain how you would use it for measuring the resistance of a wire. State and prove the equation necessary for this purpose.

15. Describe the construction and working of *one* of the following :—

(a) Telephone with microphone transmitter.

(b) Dynamo with commutator.

(c) Absolute, *or* quadrant electrometer.

(d) Induction coil, omitting condenser.

SECOND PAPER
Mechanics

[*N.B.—Only* seven *questions to be answered*].

1. State and prove the proposition known as the triangle of forces.

At any point P of a parabola forces are applied, represented in magnitude and direction by the tangent PT and normal PG terminated by the axis : prove that the resultant will pass through the focus.

2. Define moment of a force and prove that the sum of the moments of two forces acting at a point about any point in their plane, is equal to the moment of their resultant about the same point

A body is weighed successively in the two scale-pans of a false balance. Show that the true weight of the body is equal to the geometric mean of the apparent weights.

3. Find the centre of gravity of a quadrilateral lamina having two parallel sides.

4. A uniform ladder of length 70 ft. rests against a vertical wall, with which it makes an angle of 45°, the coefficient of friction between the ladder and the wall and ground respectively being $\frac{1}{3}$ and $\frac{1}{2}$.

If a man, whose weight is one-half that of the ladder, ascend the ladder, how high will he be when the ladder slips?

5. In a system of 4 pulleys in which each string is attached to a bar which carries the weight, find the relation between the power and the weight, when the pulleys have equal weights. If each pulley weigh $\frac{1}{64}$th that of the weight, find the mechanical advantage.

6. Define acceleration, and state how it is measured when uniform and also when variable. Establish the formula.

$$v^2 = u^2 - 2fs.$$

A body starting from rest moves first with uniform acceleration a and then with uniform retardation B; prove that if it comes to rest in time t measured from the beginning; having described a space s, $2s(a + B) = aBt2$.

7. A man can throw a stone 100 ft. vertically upwards; find the greatest distance to which he can throw it on a horizontal plane.

8. State the laws of impact. Two balls impinge directly; their velocities before impact are 10 and 6 cm. per sec respectively, and after impact 5 and 8 cm. per sec respectively. Compare the masses of the two balls and find the coefficient of restitution.

9. Define force work and energy. State how they are measured. What is meant by simple harmonic motion? Explain this by a diagram. What is meant by the terms amplitude and period?

PHYSICS—1910
First Paper

[NOTE.—*Full marks may be obtained by answering* NINE *question*].

1. What is latent heat ? Describe a method of finding latent heat of fusion of ice or of vaporization of water.

2. A copper calorimeter weighs 75 g. and contains 94·5 grams of water at 8°C. If on pouring in 30 g. of water at 100°, the whole comes to a temperature of 29, find the water equivalent of the calorimeter and the specific heat of copper.

3. State Boyle's and Charles's Laws, and give a symbolic equation expressing both. In 1293 grams of air occupy a cubic metre at N. T. P., what will be its volume at 30C. and 71 cm. pressure.

4. Describe Fizeau's or Foucault's method of measuring the velocity of light. Work out the formula.

5. Explain briefly the action of the pinhole camera, and more fully the use of the graphic camera.

6. Describe a Spectroscope. Name the several classes of Spectra and tell how they are produced. Give an explanation of Fraunhofer's Lines.

7. Describe the formation of overtones in strings and organ pipes, and show how to find the pitch of an open or closed pipe. What is a harmonic, and what constitutes the quality of a musical tone ?

8. Explain the production of beats.

Define—wave-length, frequency, and amplitude. What is the relation between velocity and wave-length ?

9. Define—unit magnetic, pole, magnetic moment, line of force. Sketch the lines of force due to two bar magnets laid parallel (a) with like poles together, and (b) with unlike poles together ; also those due to a current in a straight conductor, paying attention to the direction of the current.

10. Explain the action of the electrophorus. What machine is based on the same principle ?

11. Describe two forms of galvanometer:

Describe briefly the chemical action of some form of voltaic cell.

Second Paper

Mechanics

[*Not more than* EIGHT *questions should be attempted.*]

1. Prove that, if a body be thrown vertically upwards, the time of ascent is equal to the time of descent.

A stone thrown vertically upwards is observed to repass a point P after an interval of four seconds; find the velocity at P.

2. Describe Atwood's machine, and explain how it can be used to measure g.

3. Prove that, if a force acts on a moving body in the direction of its motion, the increase in the

kinetic energy of the body is equal to the work done by the force.

A shot travelling at the rate of 600 ft. a second strikes a thick plank and is found to have penetrated it 2 inches ; with what velocity must it strike the plank to penetrate 6 inches, supposing the resistance of the plank to the passage of the shot is uniform ?

4.   Define horse-power.   A belt transmits power from a wheel $3\frac{1}{2}$ ft. diameter revolving 180 times a minute.   The difference between the tensions on the tight and slack sides of the belt is equal to 200lbs. weight ; what H. P. does the belt transmit ?

5.   Define coefficient of friction.   How can it be experimentally determined ?

A particle slides down a rough plane inclined at 45°.   It is found that its velocity is half what it would have been, if the plane had been smooth. Determine the coefficient of friction.

6.   Enunciate the triangle of forces.

Two strings AC, BC are knotted at C, and the ends A, B are fastened to points in the same horizontal line.   If $AB=13$, $AC=5$, $BC=12$, determine the tensions of AC and BC, when a weight of 52 lbs. is attached to C.

7.   Define the ' centre ' of a system of parallel forces.   How is its position determined ?

A wire AD, 15 inches long, is bent upwards at right angles at B. 4 inches from A, and at C, 6 inches from D.   Prove that if suspended from A it will rest with AC vertical.

8.   Find the relation between the power and weight in that system of pulleys (the third) in which each rope is made fast to the weight.

Give a diagram of the pulleys, when $P = 3$ and $W = 93$.

9.   Determine the general conditions of equilibrium of a system of forces acting in one plane.

Prove that if the moments of the forces about 3 points, not in the same straight line, vanish, then the system is in equilibrium.

10.   A uniform rod AB of weight W and length $4a$, rests with its lower end A in contact wish a smooth vertical wall, being inclined to the wall at an angle of $60°$. It is supported by a fine light string attached to a point C of the rod ($AC = a$) and to a point D in the wall vertically above A. Find the length of the string and its tension.

PHYSICS—1911

First Paper

[N.B.—*Only* EIGHT *questions to be attempted.*
Diagrams to be neatly drawn.]

1. A copper ball weighing three kilograms, after being heated in a furnace, is taken out and plunged into 8 kgm. of water at 10°C. If the temperature of the water rose to 25°C., find the temperature of the furnace. (Sp. Ht. of copper = ′094 ; water equivalent of calorimeter, 50 gms.).

2. Describe an experiment to determine the latent heat of steam. What quantity of heat is required to convert 55 gm. of ice at 0°C. to steam at 100°C. ?

3. Describe apparatus to verify Charles' law. At N. T. P. the vol. of some oxygen is 175 c. c. ; find its vol. (to 4 significant figures) at temp. 51°C. when the barometer reads 75 cm.

4. Sketch and explain Fizeau's method of determining the velocity of light. If the image disappeared when a wheel with 720 teeth made 12′6 revolutions a second, find the velocity of light, given that the stations were 8,663 metres apart.

5. Find the relation between the distances from a concave mirror of an object and its image in the mirror. Find the position and magnification of an image of an object placed 25 cm. in front of a concave mirror of focal length 30 cm.

6. Explain the action of a direct-vision spectroscope.

7. Describe the monochord, and show how it may be used to determine the frequency of a tuning-fork. Two forks sounded together gave three beats a second ; one is found to be in unison with a length of 58 cm. and the other with 59 cm. of the monochord under constant tension : find the frequencies of the works.

8. Compare the fundamental notes and the harmonics of an open pipe and a closed pipe of the same length.

9. Describe any form of tangent galvanometer and find the relation between the deflection and the current.

10. State Ohm's Law and show how it may be demonstrated experimentally.

11. Enunciate Joule's Law as to the heating effect of an electric current. Three cells, each of e.m.f. 2 volts and internal resistance 5 ohms, are connected in series with a total external resistance of 1·8 ohms ; find (in calories) the heat evolved per minute in the external resistance.

SECOND PAPER
Mechanics

[*Not more than* EIGHT *questions to be attempted.*]

1. A passenger seated in a train A moving north-west can see another train B which is moving

north-east with a speed twice as great. Find with what speed the second train appears to him to move, and show that if 0 the angle between the eastward direction and the direction in which B appears to move, tan $0 = \frac{1}{2}$.

2. Find the acceleration of a particle moving down a smooth inclined plane whose inclination is a.

A particle, after sliding on an inclined plane for 5 seconds is moving downwards with a velocity of 50 feet per second. If it started with a velocity of 10 feet per second downwards, find the distance through which it has moved, and the inclination of the plane.

3. State Newton's Second and Third Laws of Motion, and point out their connexion with the following problem :—

Two smooth balls are moving in the same straight line, and in the same direction in it. The foremost ball is twice as heavy as the other, while the second is moving twice as fast as the first. Prove that if the balls are perfectly elastic, the ratio of the velocities after impact will be 2 : 5.

4. One end A of a rope is fixed to the roof. The rope passes under a movable pulley and over a fixed pulley. A man of weight $2W$ is seated in a chair of weight W, which hangs from the movable pulley, and he holds the end B of the rope in his hand. Find what downward pull he must exert on the end B in order to maintain his position.

5. Define what is meant by an ' absolute ' unit of force.

If an ounce, two seconds, and an inch be taken as units of mass, time, and length, compare the corresponding absolute unit of force with the poundal.

6. How would you employ Atwood's machine to prove that the distance moved through from rest in a given time, by a body under the action of a constant force, is proportional to the square of the time ?

If the two masses are 8 ounces and 10 ounces, find the acceleration, and the tension of the cord.

7. An engine weighing 10 tons can do work at the rate of 120 horse-power, and is drawing a train weighing 90 tons up an incline of 1 in 280. The resistance is constant, and is equal to 7 pounds weight per ton. Find the greatest rate at which the engine can move.

8. A body is acted upon by three coplanar forces. State the conditions necessary for equilibrium.

One end of a string is fastened to the highest point of a circular wire whose plane is vertical, and the other end is attached to a small ring of weight W, which sides on the wire. If l be the length of the string, r the radius of the circle, show that the tension is $T = W\dfrac{l}{r}$.

Describe any experiment by which you could measure the value of the co-efficient of friction between glass and wood.

A body of weight W rests on a rough plane inclined at 30 to the horizontal, and the friction is just sufficient to keep it from moving downwards. If the inclination be now increased until it is 60° to the horizontal, what force must be exerted parallel to the plane in order that the body may be just on the point of motion up the plane ?

.10.   Explain how you would find experimentally the centre of gravity of a flat plate.

$ABCD$ is a thin square sheet of uniform thickness. An equilateral triangle is described on one side as base, and is then cut away. Find the centre of gravity of the remainder.

11.   Two unlike parallel forces act on a rigid bar.   Find their resultant.

The two halves of a heavy bar are made of different metals, so that the centre of gravity is not at the middle point. If a weight equal to that of the bar is hung from the end A, the bar will balance when supported at a point distant from A by one-third of the length of the bar. Find the position of the centre of gravity.

PHYSICS—1912

FIRST PAPER

[Not more than THREE *questions from each section should be attempted. All diagrams must be neatly drawn].*

A

1. What is meant by the Specific Heat of a gas? In what respects does the specific heat at constant volume differ from the specific heat at constant pressure?

2. A clock which keeps correct time at 25 C. has a pendulum made of brass. How much will it gain or lose in a day if the temperature falls to 0 C. ?

(Cubical coeff. of expansion brass=000057).

3. Describe two methods of finding the dew point. How can you then determine the humidity of the air ?

4. What is isothermal expansion? How does in differ from adiabatic expansion? How is the work done by a gas is expanding represented on the indicator diagram ?

B

5. Given a block of glass with plane parallel faces, how would you use it (*a*) to verify the laws of refraction, (*b*) to determine the refractive index of glass ?

6. Describe two methods of finding the focal length of a convex lens.

7.   Describe the sextant, and explain how it may be used to determine the altitude of the sun.

8   What are beats ? How are they produced ? If two tuning forks sounded together produce beats, how would you determine which was of the higher pitch ?

9.   Describe and explain the production of Chladni's sand figures.

C

10.   Define the moment of a magnet. How would you compare the strengths of two magnetic fields ?

11.   How may positive electricity be produced ? Describe in detail how you would determine the sign of a charge on a given insulated conductor.

12.   Describe a copper voltameter. How would you use it to determine the electro-chemical equivalent of copper ?

13.   Define the Ampere, the Volt, the Ohm, the Farad, and the Coulomb. State the relations between these units and the corresponding absolute units.

14.   Describe any form of Wheatstone's Bridge. Explain how you would use it to determine the resistance of a given wire.

SECOND PAPER
Mechanics
[Not more than EIGHT *questions to be attempted]*.

1.   Describe how you would verify by experiment the theorem called the Triangle of Forces.

Find what force, acting horizontally on the bob of a pendulum, 60 cm. long, will draw it 30 cm. out of the vertical. The bob weighs 600 gm.; the weight of the rod of the pendulum may be neglected.

2.   Define velocity and acceleration.

The time taken by a motor-car to traverse the distance between two points, *A* and *B*, was 50 seconds. The distance between two points *A* and *B* was 500 yards, and the speed of the car at *A* was 30 miles per hour. Find the speed of the car at B, and its mean speed while travelling from *A* to *B* the retardation being supposed uniform.

3.   Find by the principle of work the mechanical advantage of a screw, working without friction.

The pitch of a screw is $\frac{2}{3}$ of an inch, and the length of the arm is 30 inches. By experiment it was found that by means of the screw a weight of 3 tons could be raised by a force equal to the weight of 56 pounds, acting at the end of the arm. Find how many foot-pounds of work are done against friction when the weight of 3 tons is raised one foot.

4.   Explain how you would make an experiment to determine the co-efficient of friction between two surfaces.

Determine the least force, which, acting parallel to a rough plane, will prevent a mass of 4 pounds from slipping down the plane, when inclined to the horizontal at an angle of 60° if the angle of friction is 30°.

5.   Explain the term *Centre of Gravity.*

Show how to find the Centre of Gravity of a quadrilateral limina (*a*) by geometrical construction, (*b*) by experiment.

6.   Describe any experiment by which you have determined the value of ' g.'

A body, falling from the top of a house, was found to take $\frac{1}{4}$ of a second in passing a door 8 feet high.   Determine the height of the house.

7.   State Newton's Second Law of Motion.

A mass of 450 pounds, moving in a straight line, changed its speed from 60 miles per hour to 45 miles per hour in 9 seconds.   What force must have acted on the mass to produce this change ?

8.   Define a *foot-pound* and *horse-power.*

A well of circular section, 6 feet in diameter and 70 feet deep, is full of water.   How many foot-pounds of work would be done emptying the well, if there be no flow of water into it ?   How long would it take an engine of 3 horse-power to do the work.

9.   Give two illustrations of the equality of action and reaction.

A sphere of weight 4 pounds, moving with a velocity of 12 feet per second, impinges directly on a second sphere of weight 8 pounds, moving in the opposite direction, with a velocity of 4 feet per second.   If the co-efficient of elasticity is 0°5, find, from first principles, the velocities of the two spheres after impact.

10. Prove that the path of a projectile is a parabola. Find the velocity at the highest point, and the range on a horizontal plane through the point of projection.

11. Show how to find the resultant of a system of forces acting in one plane. If the algebraic sum of their moments about three points not in one straight line vanishes, prove that the forces are in equilibrium.

PHYSICS—1913

First Paper

[THREE *questions are to be answered from each section. Make neat sketches of apparatus*].

A

1. Write a detailed account of any method which can be used for determining the co-efficient of expansion of a liquid.

2. A mass of 100 grm. of copper, heated to 100° C., is plunged into 150 grm. of a liquid contained in a copper calorimeter which, together with its copper stirrer, weighs 125 grm. The temperatures of the liquid before and at the end of the experiment are 20° C and 27·9°C. respectively. Find the specific heat of the liquid having given that the specific heat of copper is ·095.

3. Describe the spherometer and explain how you would use it to find the thickness of a thin flat sheet of glass.

Given that the distance between its feet is 10 cm. and that the height through which the centre pin has to be raised so that it may just stand evenly on the surface of a sphere, is ·75 cm. ; find the radius of the sphere.

4. A large still pond is situated in a country which has a cold winter. When the winter comes, describe what temperature and other changes take place in the water of the pond until it becomes covered with a layer of ice.

B

5. Briefly describe two methods by which you could compare the illumination of an electric lamp with that of a candle.

6. What do you understand by plane polarized light ? Describe any method by which it can be produced. How could you find out whether a beam of light was plane polarized or ordinary light ?

7. Describe any *one* method which has been used to determine the velocity of sound in air, explaining in what ways the result obtained was likely to be affected by experimental errors.

8. What reasons are there for believing that sound is conveyed by a wave motion ?

C

9. You are given two exactly similar pieces of iron, one of which is a magnet whilst the other is not. How could you distinguish between them ? NOTHING else is to be used.

10. Write a short account of the magnetic field around a wire which is conveying an electric current. What instruments are you acquainted with which depend on the existence of this magnetic field ?

11. What is a thermopile ? Describe its construction and the manner in which it works. For what purpose is a thermopile used.

12. The leaves of an electroscope have a small charge of positive electricity. A body which has a strong negative charge is slowly brought near. What happens and how do you account for it.

Second Paper

Mechanics

[Only SEVEN *questions to be attempted].*

1. A body starts with initial velocity u and uniform acceleration f : find the space described in the tth second.

If a body starting from rest describes 6 inches in the first second and $\frac{11}{36}$th of the whole distance in the last second, find the whole distance described and the time of describing it.

2. Enunciate the second law of motion, and thence deduce the equation $P = mf$.

The weight of a mass m pulls a mass m up a smooth plane of inclination a to the horizon, by means of a string passing over a pulley at the top of the plane : find the acceleration.

3. Define *Kinetic Energy,* and give a mathematical expression for it.

A particle is thrown vertically upward with a velocity of 32 feet per second. Prove that its kinetic energy after half a second is $\frac{1}{4}$th of what it had at the starting. $(g = 32)$.

4. A particle is projected with a velocity u at an inclination a to the horizon. Find the time that will elapse before it reaches the horizontal range, and the greatest height attained by it in its flight.

Prove that the height in *feet* of the highest point of the path is 4 times the square of the number of *second* in the time of flight.

5.   State the laws of direct impact.

A ball falls from a height of 20 feet upon a fixed horizontal plane and rebounds to height of $11\frac{1}{4}$ feet. Find the co-efficient of elasticity.

6.   Find the condition under which three forces acting on a rigid body may produce equilibrium.

Prove that a thin uniform rod cannot rest inside a smooth hemispherical bowl except in a horizontal position.

7.   Define *co-efficient of friction*.

A heavy body is resting on a plane : explain the co-efficient of friction between them can be determined by tilting the plane.

A beam rests against a wall, the co-efficient of friction at both ends being $\frac{1}{4}$, find the angle at which it is on the point of slipping.

8.   Explain how to find the centre of a system of parallel forces in one plane.

From a body of weight W a piece of weight w is cut off and removed to a distance x: show that the centre of gravity of the whole is thereby moved a distance $\dfrac{xw}{W}$ in the same direction.

9.   A heavy body is dragged up a rough inclined plane BA, by a force along the plane. If AC be the perpendicular from the top A of the plane to the horizontal base through B, prove that the total work done is equal to the work done is raising the body through the height AC *plus* the work done in dragging it along the horizontal base BC, which is considered rough.

PHYSICS—1914

First Paper

Physics

[*You may only attempt* THREE *quesstions from* **A**, TWO *from* **B**, *and* THREE *from* **C**. *The questions are of equal value*].

A

1. How would you determine the frequency of a tuning-fork ?

2. Give a graphical illustration of the manner in which 'beats' are produced, and show that the number of beats per second can be calculated from the vibration numbers of the two notes producing them.

3. Describe any method of measuring the velocity of light.

4. Describe a spectrometer. How would you use it to measure the angle of a prism ?

5. A luminous point is placed in front of a large block of glass bounded by a spherical surface ; find a relation between the conjugate foci, the luminous point being one and the other being in the glass.

B

6. It is stated in the meteorological report that the humidity of the air is 98. What is the meaning of this, and how can the humidity be determined ?

7.   Explain clearly an accurate method of determining co-efficients of expansion of rods.

8.   Define the mechanical equivalent of heat.

· Describe an experimental method of determining it, pointing out the quantities which must be measured for this purpose.

C

9.   What is a quadrant electrometer? How would you use it to compare the electromotive forces of two batteries?

10.   Define the following terms:—*magnetic moment, dip, declination, horizontal force.*   How can the dip be determined?

11.   How would you measure the resistance of a given piece of wire, with the wire bridge?

12.   Describe the construction of a simple dynamo.

SECOND PAPER

Mechanics

[*Not more than* EIGHT *questions to be attempted. The questions are of equal value*].

1.   Explain and illustrate:—motion of translation, motion of rotation, and simple harmonic motion.

Two velocities are in the ratio of 3 : 4 and their resultant is a mean proportional between them ; find the angle included by the velocities.

2. Show that the spaces described in successive seconds, by a point starting from rest and moving with uniform acceleration, are proportional to odd numbers 1, 3, 5, etc.

A body moves 45 feet and 55 feet in two successive seconds; find the space it would describe in the twentieth second from rest.

3. Define a dyne, and distinguish between a poundal and the weight of 1 lb.

A certain force acting on 1 ton five minutes gives it a velocity of 6 yards per minute. Express the force in poundals.

4. Distinguish between *kinetic* and *potential* energies. Point out the transformations of energy that take place during a complete oscillation of a simple pendulum.

5. Find the horse-power of a locomotive which moves a train of mass 50 tons at the rate of thirty miles per hour along a level railroad, the resistance from friction and the air being 16 lb. weight per ton.

6. Prove that the algebraic sum of the resolved parts of two forces in any direction is equal to the resolved part of their resultant in the same direction.

Forces of 2, 3, and 4 units act at a point O in directions parallel to the sides AB, AC, BC of an equilateral triangle respectively. Find their resultant.

7.   State the conditions of equilibrium of a number of coplanar forces acting on a body.

A uniform rod of weight w is supported from a point by two strings. *One of these makes an angle of 60° and the other an angle of 30° with the rod. Find the tensions in the strings.*

8.   Give examples of bodies in stable, unstable. and neutral equilibrium. Find the centre of gravity of three uniform wires forming a triangle.

9.   Weights of 3 lb., 5 lb., 2 lb., and 2 lb., are placed at the corners A, B, C, D, respectively of a square the length of whose sides is 8 inches. Find the position of the centre of gravity of the weights.

10.   Describe the three systems of pulleys. In a system of pulleys in which each string is attached to the weight, there are five movable pulleys each weighing half a pound and the weight is 35 lb. : what is the power ?

11.   State the laws of friction. Explain what is meant by the angle of friction. Describe an experimental method for finding the co-efficient of friction between two surfaces.

Find the least force which would drag a body whose weight is 50 lb. along a rough horizontal plane, the co-efficient of friction being $\dfrac{1}{\sqrt{3}}$

PHYSICS—1915

First Paper

Four *questions to be answered from each section. The questions are of equal value*].

A

1. How would you prepare an ordinary mercury-in-glass thermometer in the laboratory ? Would you expect your thermometer to give very reliable readings of temperature ? Give reasons for your answer.

2. What is meant by the statement that the latent heat of fusion of ice is 80 ? State exactly how you would proceed to measure this quantity experimentally.

What would be the result of mixing 3 lb. of ice at 0˚C with 4 lb. of water at 50˚C ?

3. A piece of iron weighing 12 lb. after immersion in an oil-bath is immediately plunged into a vessel containing 20 lb. of water at 11˚C. The temperature of the water rises to 35˚C. Find the temperature of the oil-bath.

Spec. heat of iron = 0·112.

4. What are adiabatic and isothermal changes ?

Explain why the barrel of an ordinary bicycle pump becomes heated when air is pumped into a tyre.

5. Distinguish between conduction, convection, and radiation of heat. Give examples of each.

Why is it that a damp cloudy night is apt to be warm ?

B

6.   Distinguish between a real image and a virtual image.   Explain the acting of a convex lens when used as a magnifying glass.   Is the image seen by the eye real or virtual ?

7.   Explain the formation of the prismatic spectrum.

If a beam of sunlight is admitted into a dark room through a narrow vertical slit, whet arrangement of apparatus would you use to produce a sharply-defined spectrum upon a screen ?   Give a diagram.

8.   How would you find the radius of curvature of a concave spherical mirror by optical means alone.

An object 6 cm. long is placed 1 metre in front of a concave mirror of 10 cm. focal length.   Find the nature and size of the image.

9.   Describe a spectrometer, and explain the function of the collimator.

10.   Give a description of any experiment you have seen which illustrates the phenomenon of double refraction.

SECOND PAPER

[*Answer only* TWO *questions from* A, *and* EIGHT FROM
B. *Each question carries 5 marks*].

A

1.   Give all the reasons you know for believing
that sound is propagated by a wave-motion.

2.   Give a brief description of the siren, and tell
how it may be used to determine the frequency of a
tuningfork.

3   Name the three main characteristics that
distinguish musical tones from one another, and tell
on what each depends How do the tones of a closed
and an open pipe differ, and why ?

B

4.   Give a list of the different kinds of Mag-
nets, and point out the particular advantages of each
form.

5.   Given a gold-leaf electroscope, a glass rod,
silk cloth, and a charged body, show how you could
find the nature of the charge.   Draw sketches show-
ing the potential and lines of force at the various
stages.

6.   Find the maximum and minimum current
that can be sent through a wire of 5 ohms resistance,
using 40 calls, each having in E M. F. of 2·1 volts
and an internal resistance of 0·4 ohm.

7.   Write down Faraday's Laws of Electrolysis
in the briefest possible form.   How much sodium
would be deposited by a current of 12 amperes in $1\frac{1}{2}$

hours, the electrochemical equivalent of hydrogen being 0·0000104 ?

8. A galvanometer whose resistance is 300 ohms is so shunted that only 0·01 of the total current flows through it. What is the resistance of (a) the shunt, and (b) of the galvanometer and shunt combined ?

9. Explain clearly the use of 'Relays' in the Morse telegraph, giving a diagram showing the connexions.

10. Define the absolute and practical units of current ; define the ohm theoretically and practically. Calculate to how many ergs a joule is equivalent. Define potential difference.

11. Describe briefly the construction and action of an induction coil. What is its use ?

12. Tell briefly what practical advantages are gained by the study of Electricity and Magnetism.

Or, Give an account of the construction and operation of a simple Direct Current Dynamo, with sketches.

PHYSICS —1916

First Paper

[*Not more than* FOUR *questions from each section are to be attempted.*]

A

1. Explain clearly the advantages and dis-advantages of mercury and alcohol thermometers.

Describe fully any form of maximum and mini-mum thermometers.

2. Define *saturated* and *unsaturated* vapours.

Describe an experiment to show that the pres-sure of steam of boiling water is equal to the external pressure.

3. Describe fully an experiment to determine specific heat of solids. Mention all necessary pre-cautions.

4. Define *latent heat* of *fusion* of ice.

Find the result of mixing equal masses of snow at—10° and water at 60°. (Latent heat for snow =80 and specific heat=5).

5. Explain fully what you mean by the *mechanical equivalent* of *heat*. Describe a simple ex-periment to determine it.

6. Explain the principle of the grease spot photometer. Two lamps of 8 and 32 candle-power are fixed 120 cm. apart. Where, on the line joining them, must a screen be placed to be equally illumi-nated by each ?

7.   At a distance of 9 inches in front of a convex lens of 6 inches focus is placed a convex of 3 inches focus : 6 inches in front of this is placed an object. Make a sketch, approximately to scale, showing the paths of the rays through the system.   What is the nature of the final image ?

8.   Explain fully with diagram the construction of a microscope.

9.   What is a *pure* spectrum ?   Explain clearly how you would produce it.   Account for the presence of *Fraunhofer's lines* in the solar spectrum.

10.   What is *plane-polarized* light ?   How would you produce it ?

Second Paper

[*Not more than* EIGHT *questions to be attempted.*]

1.   What is meant by simple harmonic motion ?

Indicate   the   relation   of   simple   harmonic motion to sound.

2.   The string of a monochord vibrates 100 times a second. Its length is doubled and its tension altered until it makes 150 vibrations a second. What is the ratio of the new tension to the old ?

3.   Explain the cause of beats.

The points of the prongs of a tuning fork *A* originally in unison with a fork *B* of frequency 512 are filed, and the forks produce 5 beats per second when sounded together. What is the pitch of *A* after filing ?

4. What is meant by resonance? Give mechanical and acoustical illustrations.

5. A long magnet is placed (*a*) with its north pole pointing to the north, and (*b*) with its south pole pointing to the north. Indicate in diagrams the positions of the neutral points, (*i.e.*, where the magnet's field of force annuls the earth's).

6. How would you determine the direction of the earth's magnetic force? What are approximately the values of the dip and horizontal force at your station?

7. An electroscope has its leaves charged with positive electricity. An electrified rod is brought close up to the plate of the electroscope, and it is observed that the leaves first collapse and then again diverge. Explain these observations.

8. Describe the construction and mode of action of an induction coil. Why is the number of turns in one of the coils much less than in the other?

9. Give a practical method of determining a resistance by means of the Post Office box.

10. Describe the construction of a tangent galvanometer, and explain how its reduction factor can be found (*a*) by calculation, (*b*) by experiment.

PHYSICS—1917

First Paper

[Not more than FOUR *questions from each section are to be attempted. The questions are of equal value.]*

A

1.   Describe a simple method of finding the coefficient of absolute expansion of a liquid.

2.   What is meant by the ' specific heat ' of a body ?

For the purposes of a foot-warmer, which is preferable, a bottle containing 10 lb. of water or a 10 lb. block of iron, both initially at 100°C ?   Explain your answer.

3.   What is meant by the ' mechanical equivalent of heat ' ?

How much work is done in supplying the heat necessary to convert 10 grms. of ice at—5°C. into steam at 100°C. ?

[Specific heat of ice is 0·5.

Latent heat of fusion of ice is 80.

Latent heat of steam is 537.

[Mechanical equivalent of heat is $4·2 \times 107$ ergs.]

4.   Define the ' dew point,' and describe an accurate method of determining it.   Why is dew more copious on some bodies than on others ?

5.   Define the thermal conductivity of a substance.

What laws of heat transfer are illustrated in the construction of a. ' Dewar vacuum flask ' or. a ' Thermos flask ' ?

B

6.   Write short notes on any *three* of the following :—

    (a) Total reflection.

    (b) Dispersion.

    (c) Double refraction.

    (d) Opera-glass.

    (e) Periscope.

7.   A candle flame 1 cm. long is 36 cm. in front of a concave mirror having a focal length of 30 cm. Find the nature, position, and size of the image, and draw a diagram.

8.   How would you arrange two convex lenses to form a telescope ? Give a diagram, and explain the purpose of each lens.

9.   Describe a spectroscope.

What will be observed in the spectroscope when the light passing through the slit comes from—

    (a) a spirit lamp with a salted wick ;

    (b) an electric light ;

    (c) an electric light in a red glass globe ?

10.   Give a clear description of any experiment you have seen which illustrates the production and the detection of ' plane polarized light.'

SECOND PAPER

[Not more than EIGHT questions to be attempted.]

1. How would you determine the velocity of sound in air in a laboratory ? State the effects of temperature and pressure on the velocity of sound.

2. Show that if a closed organ-pipe is so narrow that the correction for its end may be neglected, the proper tones of the pipes will have frequencies in the ratio of 1, 3, 5, etc.

3. Explain how two bridges should be placed in order to divide a stretched string 100 cm. long into three segments whose fundamental frequencies are in the ratio of 1 : 2 : 3.

4. What is the law of force between two magnetic poles ? Show that the magnetic intensity at points along the prolongation of the axis of a magnet varies inversely as r^3 where r is the distance of the point from the centre of the magnet.

5. How would you compare (a) the magnetic moments of two magnets ; (b) the intensities at two points of a field ?

6. How would you show that the induced electric charge on a conductor is equal in magnitude to the inducing charge, when the inducing charge is enclosed in the conductor ?

7. What is meant by electrostatic capacity ? How is the capacity of a conductor effected by bringing an earth-connected conductor near it ?

Show that the capacity of a sphere is equal to its radius.

8. State Ohm's law.

How would you arrange 30 cells, in each of which the resistance is 5 ohms, so as to send the most powerful current through an external circuit of 6 ohms resistance?

9. In what way does a wire carrying a current differ from one which does not? How are the properties so observed used for measuring currents?

10. State Joule's law.

A current of 5 amperes is passed for 10 minutes through a coil of 10 ohms resistance immersed in water. Calculate the energy spent in the coil, stating your unit. How would you find J based on this experiment?

PHYSICS—1918

FIRST PAPER

[Not more than FOUR *questions from each section are to be attempted.   The questions are of equal value.]*

A

1.   Explain how the thermal expansion of air can be utilised as a convenient means of measuring temperatures.

300 c. c. of air at 800 m. m. pressure is at a temperature of 15°C.   What is the temperature when the pressure is 1250 m. m., the volume remaining constant ?

2.   Describe how you would determine by experiment the latent heat of steam at atmospheric pressure. What circumstances are likely to interfere with the result ?

What would be the result of placing 4½ lbs. of copper at 100°C. in contact with 1½ lbs. of ice at 0°C. ?

[Specific heat of copper=0·095 ; latent heat of fusion of ice=79.]

3. State the laws which govern the transmission of heat by radiation.

You are given two ordinary clear glass thermometers and the bulb of one of them is coated with lamp-black.   Compare their readings when exposed (1) on a damp cloudy night, (2) on a clear dry night in the cold weather, (3) in the sun.

4.   What is meant by the statement that heat is a form of energy?

An iron ball, having fallen from rest through 25 metres contains kinetic energy sufficient to raise its temperature through 0·6°C.   Calculate the value of the Mechanical Equivalent of Heat.

[Specific Heat of Iron = 0·1.]

5.   Explain the difference between isothermal and adiabatic transformations, and give the equations for the corresponding curves.

Give examples of each transformation which you have noticed.

B

6. An object is placed on the principal axis of a thin convex lens at a considerable distance away. State the changes in the position, size, and nature of the image when the object is moved up to the lens. Illustrate your answer by diagrams.

7.   Describe fully any method by which you have determined the focal length of a concave mirror in the laboratory.

With mirrors which you can see but cannot touch; how would you determine whether they were plane, convex, or concave?

8.   A prism is held in the hand with its refracting edge horizontal and uppermost. Will the top of an object seen through it be red or blue?   Give reasons for your answer.

9.   Explain the construction of a spectrometer.

Why is it necessary to arrange the collimator to give parallel rays ?

10.   Explain fully how you would construct a simple microscope.   What kind of lenses would you employ ?   Give a diagram to show the path of the rays through the instrument.

SECOND PAPER.

[N. B.—*Not more than* EIGHT *questions to be attempted.   All questions carry the same marks.*]

1.   A vibrating pitchfork is held vertically near the ear.   If turned round its vertical axis the intensity of the sound is found to vary, showing four maxima and four minima in one complete revolution of the fork.   Explain this and show that the points of minimum intensity of sound lie approximately on a hyperbola fixed relative to the fork.

2.   What are Nodal points ?   Find their positions in an open organ pipe when giving successively its fundamental note and its various harmonics up to the third.

3.   Describe an ordinary resonator. Explain how resonators are used to assist the ear in detecting harmonics in a complex note.

4.   Describe arrangements for producing a sensitive flame.   Why is the flame called ' sensitive' ?

5.   In Terrestrial Magnetism what is meant by the ' dip ' ?   A road in the northern hemisphere runs due north and south and at one point an insulated conductor passes beneath it in which an electric current flows from east to west.   How will the indications of a dipping needle be affected as it is carried south along the road in the neighbourhood of the conductor ?

6.   Define unit magnetic pole.   If the repulsion between two exactly similar poles 4 cm. apart is 81 dynes, find the strength of each pole.

7.   Define the capacity of a condenser.   Show that the capacity of a parallel plate condenser varies inversely as the distance between the plates.

8.   Describe and give a general explanation of the mode of action of any ordinary electrical machine.

9.   Describe (1) a simple cell, (2) a Grove, or a Bunsen cell.   Show how difficulties due to polarisation in (1) are avoided in (2).

10.   Define unit quantity of electricity.   A current of ·75 amperes flows between two plates of copper immersed in a solution of copper sulphate. What changes take place in five minutes ?

PHYSICS—1919

FIRST PAPER

Not more than FOUR questions from each section
are to be attempted.

The questions are of equal value.

A

1.   Enumerate the principal errors of mercury-in-glass thermometers.

Find the mass of mercury expelled from a glass
bulb containing 950 grams of mercury at 0°C, when
heated to 100 C.

[Coefficient of expansion of mercury $= 0.18 \times 10$-3;
coefficient of linear expansion of glass $= 0.083 + 10$-4].

2.   Describe the wet and dry-bulb hygrometer.
For what purpose is it used?

Knowing the dew-point, how would you determine the amount of aqueous vapour present in the
air?

3. Distinguish between the terms " capacity
for heat " and " specific heat."

A ball of platinum at 90°C is put into a copper
vessel containing $1\frac{1}{2}$ lb. of water at 25°C. The
final temperature of the platinum, water, and vessel
after the experiment is 28°C; and the weight of the
vessel is $\frac{1}{2}$ lb. Find the weight of the ball.

[Specific heat of platinum $= 0.032$, and of copper
$= 0.095$.]

4. Calculate the work done by a gas in expanding against a uniform pressure.

How much work is done against atmospheric pressure when 1 gram of water at 100°C is converted into steam ? Express your result in calories.

[Increase of volume=1690 c. c. ; density of mercury $= 13\cdot6$].

5. What experiments would you perform to test the connection between the emissive and absorptive powers of a surface ?

B

6. Prove that the intensity of illumination of a surface varies inversely as the square of its distance from the source.

A and B are two sources of light, 15 feet apart, and their intensities are as $9:16$. At what points on the line joining them is the intensity of illumination the same ?

7. What do you mean by the linear magnification of an object?

In the care of a convex mirror, obtain expression for the magnification, and thence deduce the formula

$$\frac{1}{v}+\frac{1}{u}=\frac{1}{f}.$$

8. You are given a microscope and a thick block of glass. State how you would proceed to find the refractive index of the glass.

20

A mark is made on the bottom of a beaker, and a vertical microscope is focussed on it. The microscope is then raised through a distance of 1·5 cm. What height of water must be poured into the beaker in order to bring the mark again into focus?

[u for water $= 4/3$].

9.   Explain the principle of the direct vision spectroscope. How can dispersion in lenses be corrected?

10.   State how you would proceed to determine the focal length of a concave lens.

Draw a diagram showing the formation of an image by a concave lens.

SECOND PAPER

N. B.—Not more than EIGHT questions to be attempted. All questions carry the same marks.

1.   Explain the formation of echoes. A man stationed between two parallel cliffs fires a gun. He hears the first echo after two seconds and the next after five seconds. What is his position between the cliffs, and when will he hear the third echo?

2.   How would you demonstrate that the pitch of a note rises as its frequency increases? Indicate any method of determining (approximately the frequency of a note.

3.   Explain the formation of ' beats,' heard when two tuning forks which are not quite in unison are sounded together.

4. Explain what is meant by resonance. The length of a column of air in a tube closed at one end which gives the greatest resonance to a tuning fork is observed to be 32·5 cms. Find the wave length of the note emitted by the fork.

5. You are given some water, a piece of cork and two steel needles, one magnetised. How would you determine which of the needles was magnetised ?

6. What are magnetic lines of force ? Three precisely similar bar magnets are fixed vertically with their ends resting on the corners of an equilateral triangle on a horizontal table. Iron filings are scattered on a plate of glass which rests on their upper ends, two of which are north poles and the third a south pole. Give a diagram showing the forms of the lines of force mapped out by the iron filings.

7. What is meant by an electric tube of force ? Show that a tube of force cuts equipotential surfaces perpendicularly.

8. Find a relation between the electric density at a point on the surface of an insulated, charged conductor and the electric force near that point. How would you explain the power of points in discharging such a conductor ?

9 State the laws of electrolysis. A plate of copper and a plate of platinum are dipped into a solution of copper sulphate ; describe the effect of passing a current from the copper to the platinum

plate. What happens when the current is afterwards reversed ?

10. The current traversing a simple circuit which includes two identical voltaic cells is not quite twice as great as that obtained when only one of the cells is used, the circuit being otherwise unchanged. Why is this ?

11. Why is an electric light bulb made airtight and free from air ? Account for the rise of temperature in the bulb, when the current is turned on.

PHYSICS—1920

First Paper

Not more than FOUR *questions from each section are to be attempted.*

All questions are of equal value.

A

1. (a) Define Volume Elasticity, and prove that the isothermal elasticity of a gas is equal to the pressure.

(b) How would you adjust a Fortin's Barometer for taking readings ?

2. Describe the use of a Constant Volume air thermometer to determine the coefficient of increase of pressure ; and from the relation $pv = RT$, prove that this coefficient is equal to the coefficient of increase of volume.

3. Describe Bunsen's ice-calorimeter.

20 grams of water at 15°C are put into the tube of a Bunsen's ice-calorimeter and it is observed that the mercury thread moves through 29 cms. 12 gms. of a metal at 100°C are then placed in the water and the mercury thread moves through 12 cms. Find the specific heat of the metal.

4. State precisely what is meant by boiling-point and freezing-point. How are they affected by change of pressure ? Explain the cause of the phenomenon known as regelation.

5.   Enunciate Dalton's law of partial pressures. 1000 c.c. of a gas are collected over water at 20°C and 760 mm. pressure, the space being saturated with aqueous vapour. Find the volume of dry gas at N.T.P., the maximum aqueous pressure at 20. being 17·4 mm.

6.   How do you account for the difference between specific heat at constant pressure (kp) and specific heat at constant volume (kv) of a gas ?

B

7.   (a) Name and state the laws on which the study of Geometrical optics is based.

(b) Explain and illustrate the method of parallax.

8.   (a) Define Principal Focus, and find its position in the case of a Concave Mirror.

(b) Find an expression for the Magnification in the case of a Convex Mirror.

9.   (a) You are given a lens through which you can look, but which you are not allowed to handle. What tests would you apply in order to determine whether it is concave or convex ?

(b) Describe and explain a method of measuring the Refractive Index of Water.

10.   Describe Foucault's method of measuring the Velocity of Light. In an experiment the fixed mirror was 5 Kms. from the revolving mirror which made 300 revolutions per second. The

angular deviation of the return ray was $7°12''$. Calculate the Velocity of Light.

11.   Describe either

(a) Two forms of Telescope,

or (b) a Spectrometer, and its adjustments for finding the angle of a prism.

12.   What will be observed in a Spectroscope when the light passing through its slit comes from (i) the Sun, (ii) a Spirit-lamp with a salted wick, (iii) an Arc Light ? Name and explain the different kinds of spectrum formed in these various cases.

SECOND PAPER

Not more than EIGHT *questions to be attempted.*

1.   Describe a method of determining the vibration frequency of a tuning fork.

2.   Upon what does the frequency of the note sounded by a string vibrating transversely depend ?

A copper wire (density 8·8 gm. per c.c.) one meter long and 1·8 m m. in diameter is stretched by a weight of 20 kilograms. Calculate the frequency of the fundamental note.

3.   In building an organ for use in a warm climate it is necessary, in order to produce notes of a given pitch, to make the pipes longer than if they were to be used in England. Explain why this is so.

PHYSICS.—1921

SECOND PAPER

Only EIGHT questions to be attempted : all questions are of equal value.

1. Distinguish between "interference" and "beats"; and describe an experiment to show interference of Sound waves.

2. Name several methods to determine the pitch of a given tuning fork ; and show how the siren is used to find the frequency.

3. What is an "end correction"? A certain tuning fork first produced resonance in a glass tube with an air column of .33 cms.; and it could again produce resonance with a column of 100·5 cms. in the same tube. Calculate the "end correction."

4. Clearly show the relation of harmonics which are obtainable from closed and open organ pipes.

5. Define unit pole, field at a point, line of force and potential. And show how you can compare two uniform magnetic fields.

6. Distinguish between "inclination" and "declination." Show how you can determine the magnetic meridian with the help of a Dip Circle.

7. Find out an expression for the capacity of a parallel late air condenser. What change will be produced in the capacity if some other dialectric be used ?

1.   What do you mean by " specific resistance " ? Describe the principle and working of a wire bridge to measure the specific resistance of a given piece of wire.

9.   Distinguish between P.D. and E.M.F. A circuit is formed of six similar cells in series and a wire of 10 ohms resistance E.M.F. of each cell is one volt, and its internal resistance 5 ohms.   Determine the P.D. between the + ve and − ve poles of any one of the cells.

10. Explain the working of carbon microphone transmitters in telephones ; and show why an induction coil is generally connected with the transmitter.

11. State Faraday's laws of Electrolysis.   Show the arrangement and connections which you would make for obtaining a deposit of copper on a brass plate.   Explain the process started in the electrolyte when the current starts.

12.   Define the following units and give their relation to theoretical units :—Volt, ohm, Farad, Joule, Watt, Coulomb and ampere.

PHYSICS.—1922

FIRST PAPER.

A

Not more than FOUR questions from each section are
to be attempted. The questions are of equal
value.

1. Describe a Barometer, and explain what
happens when

(a) the liquid is changed;

(b) the tube is inclined ;

(c) a drop of alcohol is introduced in the tube :

(d) a hole is bored at the top.

2. The loss of weight of a weighted bulb when
immersed in a liquid at 0°C is w^o; show that the
loss w at $t°$C is given by

$$w \parallel w_o \left\{ 1 + (a - B)t \right\}$$

w here a and B are coefficients of expansion of the
bulb and the liquid respectively.

Sketch an apparatus to determine the apparent
coefficient of expansion of a liquid by the above
formula.

3. How would you determine the coefficient of
expansion of a gas at constant pressure. Calculate
the value of the gas constant R $(pv = RT)$ for air.
Density of air at $N.T.P \cdot 001293$ grms.

4. Define ' Relative humidity.' Does our opinion of dampness or dryness depend upon the absolute quantity of water vapour present ? Explain your answer fully. Describe Daniell's Hygrometer and explain how it is used to determine Relative Humidity.

5. Enunciate the First Principle of Thermodymamics. Give examples illustrating the principle.

Find the work done by a gas expanding under constant pressure.

B

6. Given, a converging lens, a plane mirror and a pin ; how will you find the focal length of the lens ?

7. Show that the refractive index of glass with respect to a liquid is given by $\dfrac{ug}{ue}$ where ug and ue represent the indices of the glass and the liquid with respect to air.

8. Show by a diagram how a converging lens will form the image of an object situated at infinity. Also show by a diagram the formation of the image in a compound Microscope.

9. Describe a simple Spectroscope, and mention its use. What are Fraunhofer's lines and how are they accounted for ?

10. Describe a method of determining the velocity of light.

SÉCOND PAPER.

Not more than EIGHT questions to be attempted.
The questions are of equal value.

1. Give an account of the nodes and antinodes formed in open and closed pipes.

2. Describe a method of determining the velocity of sound in carbon dioxide.

3. Upon what does the vibration frequency of stretched string depend ?

A steel wire 60 cm. long and ·5 mm. diameter gives a note of 240 vibration frequency when stretched with a certain weight. A second steel wire bears the same weight but is 40 cm. long and ·6 mm. diameter. Find the periodic time of its fundamental note.

4. Describe a condenser and demonstrate experimentally how the capacity and potential can be altered. Explain the terms Capacity and Potential fully.

5. What is magnetic induction ? A magnet is placed horizontally in the magnetic meridian due south of a compass needle. How will its action on the latter be affected if the needle is surrounded by a spherical shell of soft iron ?

6. Define Declination and Dip. Describe a dip circle and the method of using it.

7. Define Specific Resistance and show how to determine experimentally the specific resistance of a given piece of wire.

8. Describe the action of the suspended coil galvanometer and show the advantages it possesses over the suspended magnet galvanometer.

9. State Ohm's Law. The same current passes through a metre of copper wire 1 mm. diameter and two metres of a thinner copper wire. The difference of potential between the ends of the first wire is 1 volt and that between the ends of the second wire 20 volts. Find the diameter of the thinner wire.

10. Describe the construction of a simple telephone and explain its action.

11. Describe carefully the experiments you would make to ascertain whether an Ammeter (graduated up to 2 amperes) gives correct indications.

PHYSICS—1923.

First Paper.

Time—Three hours.

Not more than **four** *questions to be attempted from each section.*

All questions are of equal value.

Section A.

1. Describe the standard gas thermometer.

2. Enunciate Newton's Law of Cooling, pointing out its limitations. How would you verify the law experimentally ?

3. Distinguish between isothermal and adiabatic changes, and give examples.

4. Distinguish between saturated and unsaturated vapours. Into a cylinder, exhausted of air and provided with a piston, is introduced just enough water to saturate the space at 27°C. Explain what happens when—.

   (a) the volume is changed ;

   (b) the volume is kept constant, but the temperature is raised 30°C ;

   (c) the volume is kept constant, but the temperature is lowered to 10°C

3. Enunciate the First Law of Thermodynamics. Prove that $Cp—Cv—R$ ergs.

Section B.

6. Describe a total reflection method of determining the refractive index of liquids.

7. Give two methods for determining the focal length of a concave lens.

8. Describe a telescope, and obtain an expression for the Magnifying power.

9. Define Disperative Power. Explain why the image of a pin does not appear coloured when viewed through a rectangular block of glass.

10. Distinguish between the various kinds of spectra, and give examples of each.

Second Paper.

Time—Three hours.

Not more than eight *questions to be attempted.*

The questions are of equal value.

1. Define and explain the terms *frequency,* *amplitude* and *wave-length* as applied to sound waves in air. What are the differences in the sensations perceived which correspond to differences in these quantities ?

2. State the laws of vibration of strings and describe experiments to verify them. A wire of length 140 cm. and mass 52 grams is stretched by means of a load of 16 kilograms. Calculate the frequency of the fundamental vibration.

3. Describe carefully how sounds are reproduced in a gramophone.

4. Define the terms *magnetic pole,* and *strength of a magnetic field* at a given point. Calculate the

field due to a bar magnet 10 cm. long, and having a pole strength of 100 units—at a point 20 cm. from each pole.

5. Describe the magnetometer, and show how you would use it to compare the magnetic moments of two magnets.

6. Describe a Leyden jar and explain its action. If you were given two Leyden jars, a means of charging them at a constant potential, and a gold-leaf electroscope, how would you determine which jar has the greater capacity?

7. Explain the construction and use of a Wimshurst machine.

8. Enunciate Ohm's Law.

A battery is connected to a tangent galvanometer of resistance 9 ohms and produces a deflection of 60.° An extra resistance of 7 ohms is then placed in series in the circuit and the deflection falls to 45°. Calculate the resistance of the battery.

9. What is an induced current?

Describe two experiments which illustrate the production of induced currents.

10. State the laws of electrolysis and briefly explain the process of *electroplating*.

11. Describe the construction and action of a simple dynamo.

Intermediate Examination Papers, 1909

CHEMISTRY

[Only EIGHT questions to be attempted.]

1. Describe a burette, and explain its use. You are given fifteen grains of common salt : how could you divide the salt into three equal portions without the use of a Balance or Weights ?

2. Define equivalent weights. How may be equivalent weights of such substances as (1) Oxygen and (2) Copper be determined ? When 0·5 of a gram of a metal is dissolved in an acid it gives 183 c. c. of Hydrogen at 9 C., and 748 m. m. Find the equivalent of the metal.

3. How would you determine the composition of Ammonia Gas ?

If a salt of Ammonia be gradually heated to a high temperature in a confined area,—say a glass vessel,—what changes does it undergo ? And what again occurs if it be allowed to cool ?

How could it be experimentally proved that such changes actually occur ?

4. How may Bromine be prepared ? What are its physical and chemical properties ? Give its atomic weight, also the names and atomic weights of the other members of the family of elements to which it belongs.

5. State, explain and illustrate the Law of Multiple proportions. What is the Law of Charles ?

220 volumes of nitrogen have a density of 14. If we alter the pressure so that the density becomes 12, what is the new volume?

6. Give one method for the preparation of Nitrous Anhydride. Can we prepare Nitrous Acid from it ? If so, how ?

State the formulæ of (1) Potassium Nitrite, (2) Sodium Nitrate, and (3) Copper Nitrate.

By what test or tests could you distinguish a Nitrite from a Nitrate ?

7. Explain clearly what is meant by valency. State the maximum valency of (1) Phosphorus, (2) Copper, (3) Sulphur, (4) Silicon, and (5) Nitrogen. How may the valency of one and the same element vary ? What is the *effective* valency of Nitrogen in Ammonia, of Sulphur in Sulphur Dioxide Gas, and of Phosphorus in Phosphorus and Phosphoric Chlorides ?

8. Give the chemical formulæ of (1) Graphite, (2) Marsh Gas, (3) Ethylene, and (4) Acetylene.

How may Marsh Gas be prepared ?

Calculate the weight of CO_2 produced by the complete combustion of 15 litres of Acetylene Gas

9. How is Potassium prepared ? What are its physical and chemical properties ? Name and compare the halogen compounds of Potassium and Sodium. 100 grams of $KNO3$ are heated to redness : what volume of Oxygen at 39·0, and under 765 m. m. pressure, is evolved ?

10. Describe the process for the extraction of Copper from its (sulphide) ores.

How would you purify ordinary Copper so as to give it its maximum tenacity, ductility, and conductivity?

CHEMISTRY—1910

[Answer EIGHT *questions of which the* ELEVENTH
question must be one.]

1. What is meant by the equivalent and by the atomic weight of an element ? Give details of any experiment you have made or seen for the approximate of the equivalent of an element.

2. Define the terms oxidizing agent and reducing agent. Classify the following substances as oxidizing or reducing agents, giving reasons in each case : (*a*) hydrogen peroxide, (*b*) nitric acid, (*c*) sulphur dioxide, (*d*) ferrous sulphate, (*e*) chlorine.

3. How can nitrogen be prepared from ammonia or an ammonium salt ? Calculate the volume of nitrogen measured at 15°C. and 768 mm. obtained from 10·7 grams of ammonium chloride.

4. Describe the methods ·direct or indirect, by which each of the oxides of nitrogen can be prepared from nitric acid.

5. Describe the preparation of hydroiodic acid gas. Give a detailed account of experiments you would perform in illustration of the properties of the compound.

6. Describe preparation of sulphur dioxide. How may sulphur and sulphur trioxide be obtained from sulphur dioxide ?

7. How is sulphuric acid manufactured ? What chemical changes take place during the process ?

By what test would you distinguish a sulphite from a sulphate?

8. What volume of sulphuretted hydrogen at ·30C and 720 ·mm. is required to convert 1 gram of copper sulphate ($CuSO_4$, 5 H_2O) into copper sulphide? How much ferrous sulphide would be required to yield the requisite volume of sulphuretted hydrogen?

9. How are the following substances prepared from sodium chloride? —(a) sodium carbonate, (b) caustic soda, (c) hydrochloric acid.

10. How is lead extracted from the native sulphide and obtained in a commercially pure state? Explain fully the reactions involved in the process.

11. What relationship is there between the atomic weight and specific heat of solid elements;

The chloride of a metal was found on analysis to contain 79·77 per cent. of chlorine, its vapour density was found to be 66·75; the specific heat of the metal was ·237. Calculate the equivalent and atomic weight of the metal and find the formulæ of the chloride.

CHEMISTRY—191 ?

FIRST PAPER

[*Answer questions* 1, 2, 3, 4, and FOUR *others*].

1. The equivalent weight of an element being known, describe as many methods as you know for determining the multiple of the equivalent weight which should be taken as the atomic weight. Illustrate your answer by examples.

2. When 0·6 gram of magnesium was treated with diluted hydrochloric acid and the hydrogen obtained was collected over water in a endiometer at 755 mm. pressure and 20·C., the volume of the gas was found to be 626 c. c. The height of water in the endiometer was 200 mm. Find the equivalent of magnesium. (The tension of aqueous vapour at 20°C.—17·4 mm., the specific gravity of mercury = 13·6.)

3. Explain the terms :—acid. alkali, base, acid salt, and basic salt. Describe the preparation of any basic salt.

4. Describe the process in use for obtaining copper from its ores. Give an account of the properties of the metal and the modes of formation of its oxides and sulphate.

5. What do you understand by the term dissociation ? Give examples of dissociation in gases and liquds to illustrate your answer.

6. How is iodine obtained (*a*) from kelp, and (*b*) from caliche ? Chlorine displaces iodine from

its salts ; under what circumstance can iodine displace from salts containing it ?

7.   How is phosphorus usually prepared ?   Give an account of its properties and of its reactions with (a) oxygen, (b) chlorine, and (c) a solution of caustic soda.

8.   10 c. c. of a mixture of carbon monoxide, marsh gas, and nitrogen exploded with excess of oxygen gave a contraction of 6·5 c. c. ; there was a further contraction of 7 c. c. when the residual gas was treated with caustic potash.   What was the composition of the original mixture ?

9.   Name and give an account of the properties of the gases which are liberated by the action of heat upon (a) potassium nitrate, (b) ammonium nitrate, (c) lead nitrate, and (d) calcium carbonate.

10.   Describe the preparation of the following substances :—Potassium chloride from - potassium chlorate, potassium nitrate, pure sodium chloride, anhydrous magnesium chloride, and aluminium sulphate.

11.   Describe shortly in what manner the sulphates of barium, strontium, calcium, and lead differ from each other with regard to their solubility in water, and their respective behaviour with various other solvents.

———

SECOND PAPER

[Only EIGHT questions to be attempted.]

1. A substance contains :—

Carbon	32
Hydrogen	4
Oxygen	64
	100

Find its simplest formula.

2. Describe the properties of pig iron, wrought iron, and steel. How is the latter commonly manufactured ?

3. Describe carefully how you would prepare and recognize—

   (a) Sulphur dioxide.

   (b) Nitric oxide.

   (c) Carbon monoxide.

4. How does the kinetic theory of gases account for the different rates of diffusion of different gases ?

If 16 c. c. of hydrogen diffuse in 100 seconds what volume of SO_2 will diffuse in the same time under the same conditions ?

5. How is the composition of ammonia gas determined ?

How could you prepare ammonia from a soluble nitrate ?

6. How are the following prepared :—

Chrome alum, aluminium chloride, bronze, hydrogen peroxide ?

7. Explain carefully how you would prepare a sample of pure barium nitrate from barbarium chloride. Give full details of all operations you would perform.

8. In order to find the strength of a simple of hydrochloric acid, 10 grams were diluted with water and a piece of marble weighing 7 grams placed in it. When all action had ceased, the marble was removed, washed and dried and was found to weigh 2·2 grams. What was the percentage strength of the acid ?

9. Describe Pattison's process for desilverizing lead.

10. Describe the preparation of ethylene and acetylene. How would you distinguish between these two gases ?

CHEMISTRY—1912

FIRST PAPER

[*Answer* EIGHT *questions only.*]

1. State Avogadro's hypothesis, and prove with its aid that the molecules of hydrogen and oxygen must contain at least two atoms.

2. How is ozone prepared ? Describe experiments to illustrate its properties. How will you show that its molecules are represented by O_3 ?

3. A gas is allowed to diffuse into air through a porous diaphragm : the pressure on both sides of the diaphragm was equal throughout the experiment. The volume of the air which entered was 63·97 c.c ; the volume of the gas which escaped was 86·97 c. c. What was the density of the gas in question compared with that of air ?

4. Explain what is meant by ' reduction.' Illustrated by equations the action of the chief reagents which are used to effect oxidations and reductions.

5. Two oxides of lead have the following composition :—

	(1)	(2)
Lead	90·63	86·51 per cent.
Oxygen	9·37	13·49 per cent.

Calculate their formulæ.

6. Describe, with all experimental details, a method for preparing and collecting a pure dry sample of ammonia gas. By what experiments

would you demonstrate that the formula of the gas is NH$_3$?

7. What relationship is there between the atomic weight and the specific heat of solid elements ?

`The chloride of a metal was found to contain 79·77 per cent. of chlorine, its vapour density was found to be 66·75 ; the specific heat of the metal was ·237. Calculate the equivalent and atomic weight of the metal, and find the formula of its chloride.

8. What experiments would you perform in order to determine the composition by volume of each of the gases : nitrous oxide, carbon monoxide, and marsh gas ?

9. 10 cubic centimetres of a mixture of nitrogen and oxygen were mixed with 20 c.c. of hydrogen, and the mixture then exploded. The volume after explosion was found to be 21 c. c. (measured at the original temperature and pressure).

Calculate the volumetric percentage composition of the mixture.

· 10. How is coal gas prepared and purified ? Give equations to show the reactions involved in the purification.
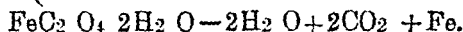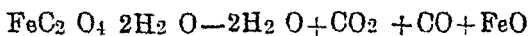
SECOND PAPER

1. Ammonium carbonate and nitric acid are given to ·you   You are required to describe minutely and in such a manner as will show you are practically acquainted with the process you   are

describing, the exact method you would use to prepare and correct some jars of nitrous oxide gas. How can you determine its composition ?

2.   From what ore is metallic lead principally obtained ? State shortly and clearly the chemical changes which are involved in the preparation of this metal. Represent by equations the actions of hydrochloric acid, nitric acid, and sulphuric acid, both dilute and strong, on the metal. What is the action of water on lead ?

3.   10 grammes of ferrous oxalate heated in hydrogen gave a mixture of iron and ferrous oxide. The product dissolved in acid gave 300 c.c. of hydrogen measured over water at 13°C. Find the percentage of iron and of ferrous oxide in the residue. Tension of acqueous vapour at 10°C is 9·1 mm.

$$FeC_2 O_4 \ 2H_2 \ O - 2H_2 \ O + CO_2 + CO + FeO$$
$$FeC_2 O_4 \ 2H_2 \ O - 2H_2 \ O + 2CO_2 + Fe.$$

4.   Give a short account of the phenomena of dissociation and describe some experiments illustrating dissociation of the vapours of sal-ammoniac and nitric peroxide.

5.   What is the chief source of phosphorous and its compounds ? Give a short but clear account of the processes employed for the preparation of phosphorus from boneash. Represent all the reactions by equations. How could you prove that common and red phosphorus are modifications of the same element ?

6.   Give a list of elements whose molecular weight in the gaseous state is abnormal. Give also the number of atoms in each molecule, and state the effect of increased temperature on the complexity of the molecule.

7.   You are given some alumina, dilute sulphuric acid, metallic iron, caustic potash, and nitric acid. State how you will prepare common alum and iron alum crystals.

8.   Describe carefully how you would prepare and best the following:—

(a) Hydroiodic acid gas (dry).

(b) Iodic acid.

(c) Methane.

(d) Phosphuretted hydrogen gas.

9.   An excess of chlorine is passed through boiling milk of lime and then potassium chloride added to the filtered liquid. Give the name and formula of the compound which crystallizes out. Represent by equations the change produced (if any) in the compound by the addition of strong sulphuric acid and hydrochloric acid respectively.

10.   There are two oxides of copper; how can they be prepared from a solution of copper sulphate ? What are their properties.

CHEMISTRY—1913

FIRST PAPER

[*Answer* SEVEN *questions only* TWO *of which must be* 1 *and* 5.]

1.   State Graham's Law of Gaseous Diffusion.

The rate of diffusion of a gas, the molecular weight of which was unknown, was compared with that of chlorine (Cl=35·5) and carbon dioxide (C=12, O=16).

The diffusion ratios obtained were :

> Cl : the gas : : 1·042 : 1·271

and Co₂ : the gas : : 1·042 : 1.

Find the probable molecular weight.

2.   State exactly what you understand by the terms ' mechanical mixture' and chemical compound.' Give reasons for and against the inclusion under either of these two classes of a solution of hydrochloric acid in water.

3.   Explain the terms acid, neutral, and basic salt, quoting examples from your experience in the laboratory.

4.   What is meant by a reversible chemical change?

Illustrate your answer by special reference to the interaction of iron and water vapour.

5.   0·810 grm. of an organic liquid were vaporized in Victor Meyer's apparatus and the volume

of air collected at 17°C. and 770 mm. pressure was 202·4 c.c. Find the molecular weight of the vapour.

6. State the reasons which have led chemists to regard one as an allotropic modification of oxygen.

7. Describe the preparation and properties of ethylene.

8. What do you know of the reactions going on in the flame of a Bunsen burner?

9. How would you detect the presence of, and distinguish between (a) ozone, (d) carbon monoxide, (c) nitrogen peroxide?

Second Paper.

[Only seven *questions to be attempted.]*

[N.B.—*In all cases definite chemical changes should be represented by equations.*)

1. Compare and contrast in a tabular form the chemical and physical properties of chlorine, bromine, iodine, and their important compounds.

2. How is sulphuretted hydrogen prepared in the laboratory? Make a careful diagrammatic drawing of the apparatus used. Indicate the value of sulphuretted hydrogen in analytical operations.

How is the composition of the gas determined?

3. Write a short essay of not more than three pages on glass.

4. Describe the properties of steel, wrought iron, and cast iron. How is the latter manufactured? Give a sketch with details of the furnace used.

5. How would you prepare the following substances in a pure condition:—

    (a) Calcium carbonate from calcium chlorice.

    (b) Ferrous chloride from ferric chloride.

    (c) Copper oxide from copper sulphate.

    (d) Lead sulphate from lead acetate.

6. How is yellow phosphorus manufactured and purified ? Compare the different varieties of phosphorus, and explain how each allotropic form may be transformed into the other.

7. What changes do the following undergo when heated—Potassium corbonate, sodium nitrate, barium sulphate, copper nitrate, ferrous sulphate and crystallized magnesium chloride ?

8. How would you distinguish—

    (a) A ferrous salt from a ferric salt ?

    (b) A chlorate from a chloride ?

    (c) A sulphate from a sulphite ?

    (d) A nitrate from a nitrite ?

9. What is the action of acids and alkalies on zinc? Describe the preparation of zinc chloride and zinc sulphate, and give their properties.

10. 0·1 gram of metal when dissolved in sulphuric acid evolves 124·2 c.c. of hydrogen at N.T.P. The specific heat of the metal is 0·23. Find its equivalent weight, its atomic weight, and its valency.

CHEMISTRY—1914.

FIRST PAPER

[*Answer* SEVEN *questions only, one of which must be Question* 9.]

1.   State the Laws of Definite and Multiple Proportions, and illustrate the latter by reference to the three compounds of the elements A and B, which contain respectively 25·00 per cent., 14·28 per cent., and 7·69 per cent. of B.

2.   Write a short account of the phenomenon termed ' dissociation.'

Which of the following substances ' dissociate ' when heated :— (a) Ammonium nitrate, (b) ammonium chloride, (c) calcium carbonate, and (d) potassium chlorate ? Give reasons for your answer.

3.   Give a very brief outline of any method for the determination of the atomic weight of an element. A metallic oxide was found to contain 47·06 per cent. of oxygen. What is the exact atomic weight of the metal, and what is the formula of the oxide ? The specific heat of the metal = 0·225, and the atomic weight of oxygen = 16.

4.   Explain the following terms, giving examples in illustration of your answer ;—(a) Compound radicles, (b) nascent state, (c) oxidizing agent, (d) catalysis, and (e) deliquescence.

22

5. Describe the process of preparation and mention the principal properties of nitric acid, giving a neat sketch of the apparatus would employ for preparing it in the laboratory.

What is the action of this acid on (a) copper, (b) silver, and (c) gold ?

Give equations for all chemical reactions.

6. You are given three jars of each of the following gases :—H_2, O_2, N_2, N_2O, CO, CO_2, C_2, H_2, C_2H_4, and CH_2. Give definite experiments by means of which you could distinguish between them.

7. Describe fully, with equations, the changes that take place in the following cases :—

   (a) A solution of a mixture of ammonium chloride and sodium nitrite is heated.

   (b) Steam is passed over red-hot charcoal.

   (c) Carbon dioxide gas is passed into lime-water.

   (d) Ozonised oxygen is passed into a solution of potassium iodide to which a few drops of starch emulsion are added.

8. Describe any method for the determination of the composition of air by weight, giving a sketch of the apparatus used.

Give definite reasons why air is considered to be a mixture.

9.   7·0 gram of magnesium carbonate were added to double its weight of dilute sulphuric acid ; after all action had ceased, it was found that 0·7 gram remained undissolved ; calculate the percentage strength of the acid.   In this reaction, what volume of gas would be evolved, measured at (a) N.T.P., and (b) 13·C· and 748 mm. pressure ?

[Mg = 24, S = 32, C = 12, O = 16, H = 1]

SECOND PAPER

[*You may attempt seven questions of which at least one must be taken from section* A.]

(N.B.—*In all cases definite chemical changes should be represented by diagrams.*)

[*Marks will be given for* NEAT *diagrams.*]

A

1.   An element M forms three compounds with oxygen.   On oxide contains 77·7 % of M and another contains 72·41 % of M.   When 120 grams of the third oxide are reduced in hydrogen 0·405 gram of water is produced.   Show that the combinations of the element with oxygen are in multiple proportions.

2.   100 grams of hydrochloric acid solution of specific gravity 1·17 contain 33·4 grams of HCl. How many litres of acid solution of this strength would be required to neutralize 5 litres of a solution

of sodium hydrate containing 0·042 gram of NaOH per cubic centimetric ? (Na = 40, Cl = 35·5).

B

3.   Write all you know of the brown gas which is evolved when dry lead nitrate is heated. State what substances are formed if it is passed into caustic potash.

4.   Draw carefully a diagrammatic sketch of the plant used for the manufacture of sulphuric acid by the ' lead chamber process.' Name each part of the plant and state its uses.

How is sulphuric acid concentrated ?

5.   Classify the oxides. Give reasons for the scheme you adopt and the characteristic properties of each class. Illustrate your answer by reference to $Al_2, O_3, Cu_2, O, Fe_3, O_4, NO. MnO_2, P_2, O_5, Pb O, Pb_3 O_4$.

6.   Describe, with full experimental details, any two distinct methods by which you have prepared carbon dioxide gas. Give full instructions for performing the experiments by which it could be demonstrated that (a) carbon dioxide is a constituent of the atmosphere. (b) carbon dioxide contains its own volume of oxygen.

7.   From the compounds named in the following list state clearly how you would prepare a specimen of the *anhydrous* chloride (or chlorides) of the metal present in each case. Alumina, barium carbonate, lead acetate, potassium chlorate.

8.   Give a *detailed* account of how you would proceed to prepare a specimen of each of the substances which are produced when concentrated sulphuric acid is heated with metallic copper.

9.   What is the action of caustic soda, on (*a*) yellow phosphorus, (*b*) metallic zinc, (*c*) chlorine, (*d*) calcium acetate, and (*e*) copper sulphate? State briefly the conditions necessary for the action you describe and give the names of all the substances formed.

10.   Describe the Bessemer process for converting cast iron into steel.   In what way is the process modified if the iron contains much phosphorus? What is 'spiegeleisen' used for ?

CHEMISTRY—1915

FIRST PAPER

[Answer SEVEN *questions only, two of which must be Questions 2 and 9].*

1.   Write a short account of Dalton's Atomic Theory, and show how this theory explains the primary laws of chemical combination.

2.   Explain the relationship between the molecular weight and the relative density of a gas.

A liquefied gas was found to boil at 22° C. One gram of the liquid gave at 27° C. a gas occupying 280 c.c. under a pressure of 722 mm. of mercury. Calculate the molecular weight of the gas.

3.   Write short notes on—

(a) The Ionic Theory ;

Or, (b) Gaseous Diffusion ;

Or, (c) The structure of a candle-flame.

4.   What do you understand by the terms ' temporary hardness ' and ' permanent hardness ' of water ? What causes hardness, and how is it removed in practice ? (Give equations).

Calculate the weight of quicklime required to neutralize the hardness of 1,000,000 gallons of water containing 16·2 grains of calcium bicarbonate per gallon.

5.   What is meant by Allotropy ? Name the allotropic modifications of oxygen and carbon ; and give reasons why they are to be regarded as such.

6. Make a list of the commonly known compounds which nitrogen forms with (a) hydrogen, (b) oxygen, and (c) oxygen and hydrogen, and give their graphic formulæ.

Describe an experiment by which the composition of ammonia can be determined, giving a neat sketch of the apparatus used.

7. Describe, with equations, the changes both physical and chemical, that take place in the following cases :—

(a) A two-anna piece is thrown into nitric acid.

(b) Carbon monoxide gas is passed over ferric oxide ($Fe^2 O^3$) heated in a hard glass tube

(c) Some copper nitrate is strongly heated in a dish.

(d) A discoloured oil-painting is washed over with dilute hydrogen peroxide.

(e) Oxalic acid is heated with strong sulphuric acid.

8. What is methane, and where does it occur in nature ? How is it ordinarily prepared in the laboratory ? Describe its properties and explain how you would distinguish it from the other hydrocarbons known to you. Give equations.

9. 40 c. c. of a mixture of carbon monoxide and acetylene gases were mixed with 100 c. c. of oxygen in a eudiometer and fired. After cooling, the residual gases occupied 104 c. c. and after treatment

with potash, the residual oxygen occupied 48 c. c. What was the volumetric percentage composition of the mixture? (The volumes given are corrected to N. T. P.).

SECOND PAPER

[Not more than SEVEN questions are to be attempted, one of which must be 10.]

1.   Describe exactly how you would prepare a pure crystalline specimen of copper sulphate from a copper coin, and how you would demonstrate its purity.

2.   Classify the following compounds into acids, alkalies, normal, acid or basic salts or oxides, and state your experimental reasons: $FeCl_3$, NaH_2PO_4, Na_2SO_4, H_2S, Al_2O_3, Cl_2O, SiO, ZnO, $(Na)_2$, N_2O_3, Na_2CO_3 and $Pb(OH)NO_3$.

3.   Explain the terms 'oxidizing agent' and 'reducing agent,' taking chlorine and sulphur dioxide as examples and quoting from your laboratory experience.

4.   How many salts do you know containing oxygen as well as potassium and chlorine? How would you identify and prepare chlorine from them?

5.   Describe the commercial preparation of phosphorous from bone-ash. How are the red and yellow varieties converted into each other? How do you account for their difference in properties?

6. Compare and contrast the properties of the alkali metals with those of the alkaline earths, making particular reference to the periodic table.

7. Describe the commercial sources and preparation of bromine. How is it chemically purified, and what are its uses ? .

8. What is the action of heat on—$KHCO_3$, KNO_3; $K_2 SO_4$, $KHSO_4$, $KCl O_4$, and $K_2, Mn_2 O_8$?

9. Write a short account, illustrating your answer by diagrams, of the chemical changes involved in the flame of a Bunsen burner.

10. An unknown metal gave the following results : —

(a) 0·5 gram gave 1·396 grams of oxide, (b) the chloride contained 11·2 % of the metal, (c) the vapour density of the chloride was found to be 40, (d) the specific heat at ordinary temperatures was 0·46, but increased rapidly with rise of temperature.

What, in your opinion, is the atomic weight of the metal ?

. ## CHEMISTRY—1916

FIRST PAPER

[SEVEN *questions only to be attempted.*]

1. Describe carefully what is meant by the equivalent of an element and show how the equivalent of sulphur could be determined. What is the relation between equivalent and atomic weight? How can atomic weight be determined from the equivalent?

2. A Duma's bulb full of air weight 27·26 grams at 12· C and 740 mm. Full of vapour at 99· C. and the same pressure it weighs 27·69 grams. The same bulb full of water weighs 239·86 grams. Find the vapour density of the substance.

What are the advantages and disadvantages of Duma's method?

3. Describe in detail the commercial process for the manufacture of sulphuric acid. Give equations for all reactions involved

4. What happens when—

   (a) magnesium is heated in nitrogen gas :

   (b) red phosphorus is boiled with concentrated nitric acid ;

   (c) copper is heated with dilute nitric acid :

   (d) zinc is treated with concentrated nitric acid ?

   Give equations in full.

5.   Describe the preparation of both forms of phosphorus and give the properties of each.

6.   100 cc. of a mixture of oxygen and nitrogen are taken in a jar.   Nitric oxide is added till no more red fumes appear.   It is found that 33 c. c. of nitric oxide are required.   What is the percentage of oxygen in the mixture ?

How is the composition of nitric oxide determined ?

7.   A mixture of carbon monoxide and hydrogen is exploded with oxygen and the residual gas measured.   It is then shaken with caustic soda solution and the residual gas again measured.

> The experimental figures were—
> (a) volume of original mixture $= 100$ cc.,
> (b) oxygen added $= 150$ cc.,
> (c) volume after explosion $= 150$. cc.,
> (d) volume after treating with caustic soda $=$ 100 cc.

Determine the composition of the mixture.

8.   How is hydrogen peroxide prepared in a pure state ?

Give equations showing the action of hydrogen peroxide on lead sulphide, silver oxide, and potassium iodide solution. .

9.   Write an account of the laws which govern gaseous diffusion.   Equal volume of hydrogen and

methane are placed in a porous vessel. Hydrogen diffuses from this at the rate of 1 litre per hour. What is the proportion of hydrogen to methane at the end of one hour ?

SECOND PAPER

[SEVEN *questions only to be attempted. All candidates must answer Question 1*]

[*All explanations of chemical changes should be accompanied by equations.*]

1. Pure carbon monoxide is passed over red hot copper oxide ; the residual metal and the carbon dioxide formed are weighed : in one experiment 24·360 gams. of oxygen were lost, and 67·003 grams. of carbon dioxide were obtained. From this calculate the atomic weight of carbon.

2. How are ethylene and acetylene prepared ? Describe the properties of these compounds.

3. Write down the names and formulæ for the oxides of phosphorus, and give details of the ordinary methods employed for the preparation of the acids corresponding to these oxides.

4. Give the names of the chief ores of zinc. How is the metal extracted from the ore ? What are the chief uses of this metal ?

5. What is the action of strong sulphuric acid upon (*a*) potassium chlorate, (*b*) copper, (*c*) sodium nitrate, (*d*) potassium iodide (*e*) ferrous oxide.

6.   Explain relations to show which of the following are oxidizing or reducing agents ;—bromine sulphuretted hydrogen, hydriodic acid sodium hydrogen sulphite, and nitric oxide.

7.   Starting with metallic lead, how would you prepare the following compounds:—lead chloride, lead sulphate, lead iodide, lead carbonate, and lead sulphide ?

8. · What means would you adopt to obtain soluble silicic acid ? How can the former compound be converted into insoluble silica ?

9.   Give a list, with formulæ, of the oxyacids of chlorine.   State how you would prepare a solution of the acid contained in bleaching powder, and of the acid contained in potassium chlorate.

CHEMISTRY—1917

First Paper

[Answer SEVEN *questions only, one of which must be Question 5.]*

{All chemical changes must be represented by equations.}

1.   Enunciate Avogadro's Hypothesis, and give reasons for taking it to be true.

If the smallest possible molecular weight of ammonium chloride be taken as its true molecular weight, and its vapour density is found to be 13·4, does this result disprove the hypothesis? If not how can it be explained?

2.   *Either,*

Stas found that 1·0 grm. of carbon yielded 3·7 grms. of carbon dioxide. When the lower oxide of carbon was passed over heated copper oxide, he found that 61·9 grms. of carbon dioxide were formed, and that the diminution in weight of the copper oxide was 22·5 grms. Deduce the percentage composition of the lower oxide, and show that the results are in agreement with the Law of Multiple Proportions,

Or,

Describe a method by which the composition of water by weight has been determined, and sketch the apparatus used. Dumas found that water contains 88·86 per cent. of oxygen. Show that this corresponds with the formula H_2O.

3.   Give examples of two oxidizing agents and one reducing agent with equations to show their action.

What happens (a) when steam passes over red-hot iron, (b) when hydrogen is passed over heated iron oxide ?   Discuss the two different results and also any other instance of the same type of reaction with which you are acquainted.

4.   Describe carefully, making a sketch of the apparatus you would use, how you would prepare and collect dry ammonia gas, and state the chief properties of the gas.   What is the action of chlorine upon ammonia, and how would you make use of this reaction to demonstrate that the formula of the gas is NH_3 ?   Give equations for all chemical reactions.

5.   0·562 grm. of a certain metal gave 380 cc. of moist hydrogen.   0°332 grm. of its chloride (liquid, boiling-point 86·C.) on vaporization in Victor Meyer's apparatus expelled 38 cc. of moist air. Temperature of laboratory 21°C. barometric pressure 758·47 mm.   Hg., and the vapour tension of water at 21°C.=18·47 mm. Hg.   Find the atomic weight of the metal.

6.   Describe, with equations, the action of heat upon (a) potassium nitrate, (b) ammonium nitrate, (c) a mixture of crystallized potassium, ferrocyanide, and strong sulphuric acid, and (d) a mixture of a solution of ferrous sulphate, nitric acid, and strong sulphuric acid.

How would you distinguish between the gases liberated ?

Write a short essay on combustion with a description of all experiments you have seen which illustrate the phenomena.

8.   Describe the preparation and properties of acetylene gas.

20 volumes of a gas mixed with 80 volumes of oxygen gave 60 volumes after explosion, and 20 volumes after shaking with caustic potash solution. What was the gas.

H=1, O=16, N=14, Cl=35·5.   Weight of 1 litre of hydrogen at N.T.P.=0·09 grm.

SECOND PAPER

[SEVEN *questions only to be attempted.   Equations must be given for all chemical changes.*]

1.   What happens when—

(*a*) sulphuretted hydrogen is passed into a solution of acid sulphite of soda.

(*b*) sulphur dioxide is passed into potassium bichromate ;

(*c*) bromine water is boiled with ferrous sulphate and hydrochloric acid;

(*d*) sand is fused with sodium carbonate?

Give equations in each case.

2.   An element forms a compound with carbon and hydrogen.   When 2·39 grms. of this compound are burned in excess of oxygen 0·88 grm. of CO_2 and 0·18 grm. of water are found.   The vapour

density of the compound is 59·75. What is the percentage of the element in the compound?

3. Explain on the ionic hypothesis what is meant by an acid, a base, and neutralization.

How many c.c. of a decinormal solution of potassium hydrate are required to neutralize 19·8 c.c. of seminormal hydrochloric acid?

4. What is charcoal? How is it manufactured in India?

Explain the use of charcoal in the manufacture of ordinary gunpowder, and show why gunpowder ' explodes when ignited in a closed space '.

5. How is glass made? How could you prepare pure silica from a sample of glass?

6. Of what does ordinary earth as (taken from a field) consist? How could you prepare from this any soluble salt?

7. Explain in detail a modern process of bleaching. How is bleaching powder made and what is its formula?

8. (a) Why is a platinum wire cleaned by dipping in hydrochloric acid and then heating it?

(b) Why are copper cooking vessels , coated with tin? How is this done?

(c) What is the best solvent for (i) iodine, (ii) phosphorus, and (iii) sulphur?

9. (a) Given ammonium sulphate, how would you prepare pure anhydrous ammonium chloride?

(b) Some ferrous sulphate is contaminated with copper sulphate and with ferric chloride. How would you purify it? ·

CHEMISTRY—1918

FIRST PAPER.

[*Represent all chemical changes by equations.*]

1.   State Dulong and Petit's Law and explain its value in the determination of atomic weights.

The following results were obtained with a certain metal:—(i) 0·5 gram gave 1·39 grams of oxide; (ii) the vapour density of the chloride was found to be 40; (iii) the specific heart at ordinary temperature was 0·46 but increased rapidly with rise of temperature. Calculate the atomic weight of the metal.

2.   What do you understand by the Periodic Law? Take at least three elements in a vertical column (*group*) and justify their association by reference to the characters in which they agree.

3.   Describe the preparation of hydrogen dioxide. State how its emperical formula HO has been determined. Make a comparison of its properties with those of ozone.

4.   How may it be proved that any given volume of ethylene contains twice as much carbon as an equal volume of methane, but the same amount of hydrogen?

20 c.c. of a gaseous hydrocarbon are exploded with an excess of oxygen. The contraction observed is 30 c.c. When treated with a solution of caustic potash there is a further contraction of 40 c.c. What is the molecular formula of the hydrocarbon?

5.   Beginning with nitre, state exactly how you would prepare (a) nitrous oxide, (b) nitric oxide, (c) ammonia, (d) nitrogen; each in a state of purity.

6.   Explain the terms oxidation and reduction. Give examples of two types each of oxidising and reducing agents with equations illustrating their action.

7.   What takes place when strong hydrochloric acid is added to (a) nitric acid, (b) sulphuric acid, (c) a saturated solution of common salt, (d) manganese dioxide.

SECOND PAPER

[SEVEN *questions only to be attempted. All candidates must answer Question* 1.]

Equations must be given for all chemical changes.

1.   A crystallised salt on being rendered anhydrous loses 45·6 per cent. of its weight. The percentage composition of the anhydrous salt is as follows :—

Aluminium 10·5, Potassium 15·1, Sulphur 24·8, and Oxygen 49·6.

Find the simplest formulæ of the anhydrous salt and of the crystallised salt.

$[H = 1,\ Al = 27,\ K = 39,\ S = 32,\ O = 16]$.

2.   Describe a convenient laboratory method of preparing Bromine or Iodine.

In what respects does Bromine resemble and differ from Iodine?

What substances liberate Iodine from Potassium Iodide?

3.   Give a concise account of the Leblanc process for manufacturing Sodium Carbonate, limiting your description to that of the essential chemical reactions taking place and carefully pointing out the character of these reactions.

4.   How would you prove experimentally that the molecule of Sulphur Dioxide is represented by SO_2?

Give a sketch of the apparatus you would use.

5.   What are the chief ores of Iron? Give an outline of the method of extracting Pig-Iron from its ores.   What is its composition?

6.   Describe the changes which take place when concentrated sulphuric acid is added to

(a) Water. (b) a mixture of Sodium Chloride and Manganese Dioxide, (c) Sodium Bromide, (d) Sulphur, (e) Potassium Chlorate, and (f) Potassium Perchlorate.

Heat can be applied if necessary.

7.   How would you prepare any three of the following : —

(a) Calomel, from Mercuric Sulphate.

(b) Stannic Chlorides from Tin.

(c) Bleaching powder from Calcium Hydrate.

(d) Soluble Silicic Acid from sand ?

8.   How are Phosphorus Oxide and Phosphorus Pentoxide respectively prepared from Phosphorus ? What happens when Phosphorus Pentoxide is dissolved in cold water and then the solution boiled ? What is the action of heat on Orthophosphoric Acid ?
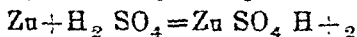
CHEMISTRY—1919

FIRST PAPER

1. (a) What is the equivalent weight of an element? Does its value depend on experiment or theory?

(b) How would you ascertain the equivalent weight of iron?

(c) What further information would you require to deduce its atomic weight and how could this information be obtained?

2. Give a sketch of the apparatus you would use to dry and collect (i) oxygen, (ii) ammonia, (iii) chlorine.

3. The action of zinc on dilute sulphuric acid is commonly represented by the equation.

$$Zn + H_2 SO_4 = Zn SO_4 H_2$$

(a) What experiments would you have to perform to prove that the action is correctly represented.

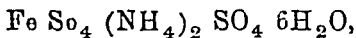(b) State fully all the facts conveyed by this equation.

4. What do you mean by Hard Water? Is there any objection to hard water? How can it be softened?

5. You are given a ten per cent. solution of aluminium sulphate: state with experimental details how you would prepare pure specimens of (a) common alum, (b) aluminium chloride.
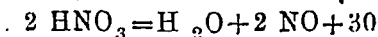
6.   How would you distinguish between—

(a) sodium nitrate and sodium nitrite ;

(b) postassium bromide and potassium iodide ;

(c) sodium chloride, potassium. chloride, and ammonium chloride ;

(d) well water and distilled water ;

(e) carbon monoxide and marsh gas !

7.   How many ccms, of nitric acid (density 1·35, strength 56 per cent. by weight) are required to oxidise ten grams of ferrous ammonium sulphate.

$$Fe\ So_4\ (NH_4)_2\ SO_4\ 6H_2O,$$

assuming that the nitric acid decomposes thus :

$$2\ HNO_3 = H_2O + 2\ NO + 3O$$

[Fe = 55·85, S = 32·07, O = 16, N = 14·01, H = 1·08.]

___

SECOND PAPER

SEVEN questions only to be attempted.
Equations must be given for all chemical changes.

1.   Compare and contrast in a tabular form the preparation and properties of the hydrides of nitrogen phosphorus, arsenic and antimony. How are arsenic compounds detected in presence of those of antimony ?

2.   Write a short essay of not more than four pages of your answer-book on the different processes for the recovery of metals from their ores.

3. How is absolutely pure sulphuretted hydrogen prepared in the laboratory ? Sketch the apparatus used. Indicate the value of sulphuretted hydrogen in analytical operations.

4. What are the general methods of preparing salts—

(a) when they are soluble in water ?

(b) when they are insoluble in water ?

Illustrate your examples in each case from the actual salts you have prepared in the laboratory.

5. How is sodium bicarbonate prepared on the large scale ?

Is its reaction alkaline, acid, or neutral ? How much sodium bicarbonate will you require to make

one litre of $\frac{N}{25}$ soda carbonate solution ?

6. Starting with ferrous sulphate, how could you obtain, (a) metallic iron, (b) ferric chloride, (c) ferrous oxide, (d) iron sesquioxide, (e) magnetic iron oxide ?

7. Compare and contrast in a tabular form the physical and chemical properties of iron, copper, lead, and tin.

8. Enumerate the chief uses of lime, and state the causes of the hardening of mortar. Starting with a piece of marble, how would you prepare :— (a) lime water, (b) milk of lime, (c) calcium chloride, (d) quick-lime ?

9. Give two examples of mixture of two solutions being attended with—

>   (a) the formation of a precipitate ;
>
>   (b) the evolution of a gas ;
>
>   (c) a change or discharge of colour.

Explain the reaction taking place in each of the six examples given.

CHEMISTRY.— 1920
First Paper

1. Describe experiments by which you would show that sulphuric acid is dibasic.

2. Tabulate the principal properties (solubility, colour, stability, etc.) of all the chlorides you know.

3. You buy one chatack (say sixty grams) of common salt in the bazzar. (a) State fully the successive steps by which you would obtain from it a relatively pure specimen of sodium chloride. (b) If the solubility of sodium chloride be taken as 40 grams in 100 grams of saturated solution at 100° and 35 in 100 at room temperature, calculate roughly how much sodium chloride you can obtain by the process you have described.

4. Give equations (with notes if necessary but without detailed description) to show two methods of preparing each of the following : (a) Nitrogen, (b) Sulphur dioxide, (c) Sulphur trioxide, (d) Hydrogen iodide, (e) Carbon monoxide.

5. Explain carefully what you mean by *acid, base, salt.* Classify the following, giving your reasons in each case :—
(i) $NaHCO_3$, (ii) NH_3, (iii) NO, (iv) $CuSO_4$, (v) $P(OH)_3$.

6. A piece of kankar weighs 2·50 grams. After heating at 100° it weighs successively 2·22, 2·19, 2·19 grams. It is dissolved in acid and the dry gas evolved measures 55 ccs. over mercury at 25° and 755 mm.

Calculate the percentage of chalk in (a) the original kankar, (b) the dry kankar.

(Ca = 40, O = 16, C = 12. You may assume that chalk is the only substance present which evolves gas).

7. What products are obtained by the oxidation of ethyl alcohol?

8. Explain the terms saponification, amine, amide, aldehyde, alcohol acid, hydrocarbon.

SECOND PAPER.

Equations must be given for all chemical changes.

1. Explain the following terms:—flux, slag, calcination, and reverberatory furnace. Illustrate your answer by reference to actual processes.

2. How would you prepare (a) a ferrous salt and a ferric salt, (b) a cuprous and a cupric salt, (c) a mercurous and a mercuric salt? Describe the difference in appearance and in properties in each case.

3. (i) What elements are present in (a) steel, (b) bone, (c) china, (d) wood, (e) a rupee, (f) a diamond? (ii) How do you account for the ignition of an ordinary lucifer match and of a safety match? (iii) What different substances could be added to milk of lime, which cause it to from a clear solution? Explain the action of each one added.

4. Explain the reactions that take place when the following substances react on one another, and give the chemical equations:—

(a) Potassium nitrate and sulphuric acid, (b) carbon and sulphuric acid, (c) caustic soda and phosphorus, (d) caustic soda and zinc, (e) caustic-soda and chlorine.

5. (a) What weight of sulphuric acid would be required to convert the sodium chloride, obtained from two litres of sea-water, completely into sodium sulphate? Sea-water contains 3·42 per cent. by weight of common salt. Density of sea-water = 1·04.

(b) Calculate the weight of the chief product obtainable by passing chlorine into a dilute and cold solution of 2·9 grams of caustic soda.

$$Na = 23, Cl = 35·5, O = 16.$$

6. Give structural formulae for the following :— chloroform, acetone, glycerine, oxalic acid, ethyl acetate, acetyl chloride, add urea.

7. How is ordinary vinegar manufactured? How would you prepare from vinegar (a) glacial acetic acid, (b) marsh gas, (c) acetone?

CHEMISTRY.—1921

FIRST PAPER.

Equations and clear sketches of apparatus to be given wherever necessary.

1. What do you understand by the terms "equivalent weight" and "atomic weight" of an element and why is the determination of the former a necessary preliminary to the determination of the latter? Explain briefly the different methods by which they may be determined and shew how each of these is actually applied in the case of carbon for the determination of its equivalent and atomic weights.

2. Indicate usual composition of the ordinary atmospheric air, explaining the functions of its different constituents. Describe with clear experimental details how the gravimetric proportion of oxygen and nitrogen in air can be determined.

3. Starting from common salt, indicate briefly the various ways in which you can prepare chlorine and hence its different oxy acids.

4. Describe briefly the different ways in which you can prepare *any three* of the following :—

(a) Nitrogen peroxide, (b) Fuming sulphuric acid, (c) gelatinous silicic acid, (d) phosphoretted hydrogen and (e) the three phosphates of soda.

5. Describe the preparation and properties of the hydrides of nitrogen, phosphorus, arsenic and antimony.

6. How can you prove that ethyl alcohol is a compound of carbon, hydrogen and oxygen? Indicate briefly how, starting from ethyl alcohol, you will prepare step by step acetaldehyde, acetic acid and acetyl chloride. Give the full graphical formula for each of these.

7. What is the action of phosphorus trichloride on alcohols and acids?

SECOND PAPER

Equations must be given for all chemical changes.

1. Write an account of the various forms of fuel which are used in manufacturing processes, and describe the different forms of furnaces with which you are acquainted.

2. Contrast the physical and chemical properites of mercury with those of magnesium and zinc.

3. Give equations where necessary to explain reactions and state exactly what will happen—

(a) When chlorine gas is passed into an aqueous solution of each of the following substances :—

Potassium bromide, caustic potash, ferrous sulphate, ferric chloride, and stannous chloride?

(b) When each of the following substances are added to a solution of copper sulphate :—

Metallic iron, metallic mercury, caustic soda solution, potassium iodide solution, and ammonia?

4. What are the chief compounds of aluminium which occur in nature? Describe the chief chemical

and physical properties of alumina and aluminium hydroxide. How will you prepare a pure sample of aluminium chloride from alumina?

5. Indicate the irons in dilute aqueous solution of each of the following :—

Sodium hydroxide, potassium nitrate, ammonium chloride, cuprous chloride, zinc sulphate, ferric chloride and sulphuric acid.

6. Describe in detail the most successful organic preparation which you have performed in the laboratory.

7. What is soap? Can soap be prepared from kerosine oil? Describe briefly the manufacture of soap.

8. Give structural formula of the following :—

Glycol, propyl amine, chlor acetic acid, ethyl propyl ether, ethyl malonate.

CHEMISTRY.—1922

FIRST PAPER.

1.   Explain with examples the following terms:
—Valency, atomic heat, nascent state, allotropy, hydrolysis.

2.   Give an account of three different cases of preparing chemical elements (gases) by electrolysis with the precautions to be taken for collecting the products.

3.   How is hydrochloric acid manufactured ? What are the chief impurities in the commercial acid ?   On what evidence do we accept HCl as expressing the composition of hydrochloric acid gas ?

4.   Write the equations for the reactions between the following pairs of compounds :—

(a) lead nitrate and sulphuretted hydrogen ;

(b) potassium hydroxide and sulphur dioxide ;

(c) phosphorous pentabromide and water ;

(d) potassium iodide and nitrous acid ;

(e) hydrochloric acid and nitric acid.

5.   Make a careful diagrammatic drawing of Kipp's apparatus, and explain how it is used for the preparation of sulphuretted hydrogen gas.   Mention cases where the apparatus is used for the preparation of other gases.

6,   What are kerosene oil, vaseline, and glycerine ?   Write a short note on the kerosene oil industry.

7.   Suppose you were given four liquids and told that amongst them you would find :—methyl alcohol, ethyl alcohol, acetone, and formalin. How would you proceed to discover which was which, and how would you determine their purity?

8.   A compound containing C, H and O, of which ·3696 grams was taken, gave on combustion ·5420 gram CO_2 and ·2168 gram H_1O. Find its simplest formula and state whether this formula is necessarily the same as the molecular formula, giving reasons for your answer.

Second Paper.

(*Equations should be given wherever possible.*)

1.   Give two methods by which ferrous salts can be converted into ferric and *vice versa* ? What is the valency of iron ?

2.   What are the chief sources of copper ? Describe one method by which the metal is obtained from its ores on the manufacturing scale.

3.   How do metals differ from non-metals ;

You are given a piece of graphite and a piece of lead. Describe very briefly what experiments you would perform in order to discover to which class each of them belongs.

State fully, and as far as you can explain, what happy when the following solutions are mixed :—

(a) Ammonia and a copper salt ;

24

(b) Potassium hydroxide and a zinc salt ;

(c) Nitric acid and ferrous sulphate ;

(d) Calcium hydroxide and calcium bicarbonate ;

(e) Sulphuretted hydrogen and ferric sulphate.

5. A piece of metal weighing 0·1 gram dissolves in dilute acid with evolution of 102 ccms. of hydrogen measured dry at 27·C and 751 mm. Its specific heat is 0·26. Find its equivalent, atomic weight and valency and state clearly the reasoning by which you connect these three values.

6. What are esters ? How do they differ from salts ?

7. Describe any experiment you have seen to show the products obtained by the destructive distillation of wood.

8. Describe the preparation and properties of common ether.

Or,

Give an account of the various combinations into which acetaldehyde can enter.

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CHEMISTRY.—1923

First Paper

Time — Three hours.

1. (a) Explain the construction and use of a desiccator.

(b) Describe a method for determining the temperature at which (i) a solid melts, (ii) a liquid boils.

2. (a) State Graham's law of diffusion and describe an experiment to show that hydrogen diffuses more rapidly than air.

(b) How many cubic centimetres of hydrogen will pass through a porous plug in the same time as 2 c.c. of air ?

3. (a) Give two methods of preparing nitrogen with their relative merits.

(b) Give with equations an account of the oxidising action of nitric acid in four cases.

4. To what is hardness of water due, and how may it be removed ? 200 c.c. of water requires 9 c.c. of $\dfrac{N}{50}$

H_2SO_4 for neutralization with methyl orange. What weight of quick lime must be added, in the form of lime water to soften 150 gallons of this water ?

5. How are chloric and perchloric acids prepared ? How would you proceed to determine the formulæ of these acids ?

6.   Give equations for the reactions between the following pairs of compounds:—

(o) Aluminium and caustic soda, (b) bleaching powder and sulphuric acid, (c) moist chlorine and sulphurous acid, (d) sulphurous acid and nitric acid, (e) moist ferric chloride and chalk.

7.   Compare and contrast the physical and chemical properties of:—ethyl alcohol, ethylene glycol, and glycerine.

8.   Write down the structural formulæ of *three* members of each of the following:—

amine, amide, ether, acid anhydride, and dibasic acid.

———————

SECOND PAPER.

Time—Three hours.

1.   Describe the preparation and properties of sodium hydroxide.

2.   Compare the properties and composition of cast iron, wrought iron and steel.

3.   How would you prepare a pure specimen of barium acetate from barium nitrate? What would be the theoretical yield from 100 gms? (The atomic weight of barium is 137.)

4.   Compare the sulphides of mercury, arsenic, lead, tin and antimony.

5.   How do the following metals act on nitric acid: iron, mercury, zinc, magnesium, tin, aluminium?

6.   Compare the properties of ethylene and acetylene.   How are they prepared?

7.   Describe the principal reactions of acetic anhydride and of acetyl chloride.

8.   How is acetone prepared?   How can it be separated from alcohol?

9.   Compare acetamide and ethylamine.

Intermediate Examination Papers, 1909

BIOLOGY

First Paper

[Not more than SEVEN *questions to be answered.
Use diagrams where possible.]*

1. Define accurately the term tissue. Describe the various types of muscular tissue, stating their differences, and give instances of organs where they occur.

2. What are the interstitial cells in the Hydra? Where do they occur? What structures are derived from them?

3. Describe as fully as possible the nervous system of the earth-worm. What is nerve-ganglion?

4. Describe the structure of the ovary of the frog as seen just before the exit of the ova. Where is it situated, and from which of the three germ-layers is it derived? What happens to the ova in the passage down the oviduct?

5. Give some account of the physical and chemical properties of protoplasm. Define briefly *ectosarc*, *pseudopodium*, and *contractile vacuole*.

6. Distinguish between epithelial tissue and connective tissue. In a transverse section of the alimentary canal of the frog state in order from

within outwards the various layers of tissues met with.

7.   Give a brief account of the processes of digestion and absorption that the food undergoes in the case of the frog.

8.   Give some account of the notochord, its structure and origin.

9.   Trace the larval development of the frog from the first-formed tadpole to the adult frog, with special reference to the changes undergone by the respiratory system.

10.   By what special characters would you recognize an invertebrate animal and achordate animal.

SECOND PAPER.

[Attempt not more than SEVEN *questions.   Use diagrams wherever possible]*

1.   What are starch grain ? Describe their structure and mode of growth. By what micro-chemical tests may they be recognized ?

2.   Describe stomata and explain their function. Explain the method by which this function is performed.

3.   Make a sketch of a typical transverse section of a young dicotyledonous stem. Name and describe its various parts.

4. What are the functions of a root? Explain the structure and uses of the root-cap and root hairs.

5. What is meant by self-fertilization and cross-fertilization? Give in detail two illustrations of special arrangements to prevent self-fertilization.

6. Describe and sketch the various forms of ovules. What is the embryo-sac? Describe the changes that take place in it before fertilization.

7. What is the function of chlorophyll? Where and under what conditions does assimilation take place?

8. Distinguish clearly between a parasite and a saprophyte, and explain how the latter obtains its nourishment. Give examples of each.

9. Describe the life-history of any typical fern.

10. Describe the microscopic appearance, and the modes of reproduction of yeast. What reasons have you for regarding yeast as a plant?

BIOLOGY – 1912

First Paper

Zoology

[Any SEVEN questions to be answered.   Diagrams should be used where possible.]

1. Give a clear and detailed description of the structure of the animal cell.   Describe the processes of cell-division.

2. Explain the structure of the heart and truncus arteriosus in a frog, and show how the blood circulation is influenced by their structure.

3. Give an account of the Hydra—who it carries on its ordinary life, its structure, and methods of reproduction.

4. What is meant by mesoblast?   How does it originate, and what tissues of the body are derived from it?

5. Compare together the methods of respiration in the worm, the young tadpole, and the adult frog, explaining how it is accomplished in each.

6. Mention in order, from within outwards, the various layers of tissue met with in a transverse section of the stomach of a frog.   Explain the functions of each tissue mentioned.

7. Make a sketch showing the appearance of the dorsal surface of the brain of a frog as seen on dissection.   Name each part.   Write a brief description of the cranial nerves.

8.   State and explain as far as possible the more important facts known about fertilization and segmentation of the ovum.

9.   Describe the structure of the circulatory system of an earthworm. What is the composition of its blood ?

10.   Give the general characters of a chordate animal, and explain the structure and origin of the notochord.

Second Paper
Botany
[Attempt not more than SEVEN *questions. Use diagrams wherever possible.]*

1.   Give an account of the life-history of Mucor What are Gonidia, and wherein do they differ from ordinary sexual spores ?

2.   What is necessarily involved in a sexual method of reproduction ? Wherein does the sexual reproduction of Mucor differ from that of a fern ?

3.   Describe the various forms of climbing plants, giving details of their mode of growth.

4.   Distinguish clearly between a *rhizome*, a *rhizoid* and *root*. What is a vascular cryptogam, and why is it so called ?

5.   Of what does the wall of a plant-cell usually consist ? Indicate some of the chemical and physical changes which sometimes occur in cell-walls, and tell where examples of each may be found.

6. Wherein do Monocotyledons generally differ from, Dicotyledons as regards (a) the stem, the root, (c) the leaf, (d) the flower, (e) the seed ?

7. What is meant by a collateral vascular bundle? Describe carefully the structure of one of these as it is found in a typical dicotyledonous stem. What is the endodermis, and how may it be distinguished under the microscope ?

8. What is the essential difference between the racemose type of branching and the cymose ? What is a sympodium, and how is it formed. How would you distinguish between a true and a false raceme ?

9. What is (a) endosperm, (b) perisperm ? How are these tissues formed, and what is their function ? Give an example of a seed which is (a) albuminous, (b) exalbuminous.

10. Distinguish clearly between transpiration, respiration, and photosynthesis. Describe an experiment by which you might show that plants respire.

BIOLOGY—1913

FIRST PAPER

Zoology

*[You may answer any SIX questions, but not more.
Diagrams should be used wherever possible.]*

1. Describe the structure of the pectoral girdle of the frog. State which parts are cartilage bone, membrane bone, and cartilage respectively.

2. If you were given a freshly killed frog state in detail where you would obtain and how you would prepare microscopic preparations to show the structure of (*a*) unstriped muscle fibre, (*b*) cartilage, (*c*) ciliated epithelium. Describe in each case the appearance of the preparations.

3. Describe the normal characters of the nucleus of an animal cell, and then, trace all the stages that occur in that method of nuclear division known as karyokinesis or mitosis.

4. Give an account of the various types of cell found in the ectoderm of the hydra. In what respect does the body-wall of hydra differ from that of the earthworm and frog?

5. Trace the development of the frog's egg through the stages from fertilization up to the time of formation of the neural groove and the notochord. Illustrate in your answer the origin of the three primary germinal layers.

6. Explain, with reference to the animals you have studied, the following terms: (a) secretion, (b) ferment, (c) cerebral vesicles, (d) cnidoblast, (e) gamete, (f) metamerism, (g) ganglion.

7. Describe the method of and the organs concerned in the elimination of nitrogenous waste matter from the body in the amœba, the earthworm, and the frog.

8. Give as full an account as you can of the vascular system of an earthworm. What are the functions that the blood has to perform in the earthworm?

9. Contrast and compare the body cavity of the hydra with that of the earthworm. What do you consider to be the function of the coelom?

Second Paper

Botany

[N.B —*Not more than* SEVEN *questions to be attempted. Illustrate your answers by simple diagrams wherever possible.*]

1. Enumerate the food substances commonly stored up in seeds. By what test may they be recognised?

2. Describe the sporangium of a Fern. By what mechanism are the spores liberated and disseminated? What changes take place in these latter if they are subjected to favourable conditions?

3. What parts of the flowering plants may enter into the composition of the 'fruit'? Give examples.

4. Give full account of the differences which exist between Spirogyra and Mucor with regard to their modes of nutrition.

5. Give an account of the various ways in which underground steams may be modified. How may they be readily distinguished from roots?

6. What are plastids? Where do they occur, and how do they function?

7., What do you understand by 'Secondary Growth' in the wood? Describe the process as it occurs in the stem of a Dicotyledonous plant.

8. What is meant by Fertilization? Describe briefly the process in a flowering plant and a fern.

9. Describe the histrological structure of a transverse section of a typical foliage left. State what are its functions, and indicate how it is adapted to perform them.

10. What do you understand by the terms:—bulbil, tendril, stipule, spine, adventitious, roots, cladode, phyllode, epicalyx; perianth, sporophyll?

BIOLOGY—1914

FIRST PAPER

Zoology

[N.B.—*Not more than* SIX *questions are to be attempted, of which the* FIRST *must be one. Illustrate your anwers by simple diagrams in every case.*]

1. *Either*, Give a brief account of the frog's skull (omitting the lower jaw). Define clearly the relation of the various bones to the chondrocranium.

Or, Describe and compare the pectoral girdle and sternum of frog and a rabbit.

2. Describe fully the *structure* of amoeba, as illustrating the typical animal cell. In what particulars do the cells found in blood, cartilage, and bone differ from such a typical cell?

3. Describe the alimentary system of the rabbit. Draw carefully a diagram showing the parts clearly displayed and named.

4. What are the essential differences between the coelenterate and the coelomate animal? Illustrate your answer by two simple diagrams representing transverse sections through the body of hydra and earthworm respectively.

5. Explain the meaning of the following terms as applied to structures found in the frog :—Spermatocyte, nephrostome, central canal, mucous, membrane, Bowman's capsule, carotid gland. Haversian canal, hyoid arch.

6.   What are the principal characters which mark the vertebrata ? How would you distinguish a vertebrata from an annelid and the latter from an arthropod ?

7.   Describe the structure of the spinal cord of the frog, marking in a diagram of a typical transverse section the structures which you describe. What histological elements are found in 'nervous tissue' ?

8.   Describe the mode of locomotion and the organs concerned in the common Indian earthworm. How would you prepare for microscopic examination the chief organ concerned ?

SECOND PAPER

Botany

[*Only* SEVEN *questions to be attempted.   Use diagrams to illustrate your answers wherever possible.*]

1.   Give an account of the action of light on plants.

2.   Describe and explain with reference to examples, the peculiarities of the root of biennial plants.

3.   Why do the withered leaves remain on a dead branch of a tree at the end of the year instead of falling as the other do ?

4.   Give some account of the structure and mode of life of yeast.

What is *anaerobic* respiration ?

5.   Make a drawing showing the appearance in transverse section of any leaf you know.   Name the tissues shown and briefly describe the functions of each.

6.   Describe three cases where the parts of the flower are specially modified to ensure cross-fertilization by insects.

7.   Describe in detail the development of the lateral root system of a plant.   In what respects does it differ from the development of lateral shoots?

8.   What part does osmosis play in plant life ?

9.   What are the necessary conditions for germination?   Illustrate your remarks by reference to the bean (or castor) plant.

10.   Why is it necessary that the transpiration current should be kept up ?

BIOLOGY—1915

FIRST PAPER

[Answer not more than FIVE questions. Illustrate your answer with simple diagrams wherever possible.]

1. Describe the various kinds of muscular tissue found in hydra, the earthworm, and the frog. Say what you know of the uses of these various kinds of muscles, and state in what parts of the body they occur. Describe in detail how you would proceed to make simple microscopic preparations of the same.

2. Give a *full* account of the modes of feeding and locomotion of the earthworm, and the uses of the unicellular mucus glands, dorsal pores, and prostomium. Has the earthworm been, directly or indirectly of any use to man ?

3. Define clearly what is meant by (a) an organ, and (b) a tissue, and provide two illustrations of each. Since amœba is 'unicellular organism,' does it possess organs? Name all the organs derived wholly or in part from the hypoblast in a vertebrate animal.

4. In how many ways do chromosomes divide, and what are objects supposed to be attained by the divisions ?

5. Why does hydra at one time multiply sexually at another time asexually ? What is the distinction between a sexual multiplication and growth ?

6.   Describe briefly all the means employed to render digestible the food swallowed by the frog. Define the term 'digestible.' What in brief is the mechanism which ensures the 'supply on demand' distribution of the food to the tissues?

7.   Compare the processes of fertilization as they occur in amœba, hydra, the worm, and the frog, and contrast their relative efficiency.   (*N.B.*—By 'process of fertilization' is to be understood 'all the means adopted to ensure the fusion of the gametes).

8.   Why is the frog said to possess a larval stage in its development, whilst hydra and the worm do not?   Describe briefly the chief differences between the vascular system of the tadpole and that of the frog.

Second Paper

Botany

[*Answer* six *questions only.*]

1.   The cells of a leaf that has been kept in alcohol are found to contain granules which are suspected to be either starch grains, proteid granules or chloroplasts.   State exactly what you would do in order to decide which they are.

2.   It has been found that the watery sap in the stem of a common Indian plant is several degrees of temperature below that of the surrounding atmosphere.   Explain this phenomenon.   What are the functions of the sap?

3.   Give an outline account of the life-history of any fern and then explain in more detail the structure of the gametophyte generation.

4.   Describe the structure of (a) sieve tubes, (b) the pericycle of a stem, (c) the endodermis of a root, (d) the epidermis of a leaf, (e) collenchyma. What tests would you apply in each case to determine the chemical composition of their cell-walls and what results would you expect to get ?

5.   Describe the structure of the anther of a flowering plant.

6.   What are the chief characteristics of the fungi ? Illustrate your answer by reference to Mucor and Yeast.

7.   What is meant by 'placentation'? What are the chief forms of placentation met with amongst the flowering plants?

8.   Give an account of the different modification found amongst plant leaves to enable them to perform various functions.

BIOLOGY—1916

First Paper

[N.B.—*Question 1 is compulsory. Not more than
5 questions in all to be attempted. Neat dia-
grams to be employed to illustrate the ans-
wers wherever possible. Marks will be
awarded for the orderly presentment of
facts and clear exposition.*]

1. What suggestion can you offer in explanation
of the following facts?—

(*a*) the eyes of the frog and rabbit are in both
cases protuberant and situated well at the sides of
the head, whereas in the dog or cat the eyes are
situated more in front and are more deeply set in
the head ;

(*b*) in both the rabbit and the frog and in most
other animals the upper surface of the body is darker
(more deeply pigmented) than the lower ;

(*c*) the neck region of the frog is very feebly dis-
tinguishable from adjoining regions, but in the rabbit
the neck is comparatively long and flexible, enabling
the animal to turn its head from side to side ;

(*d*) most fishes have small paired appendages and
powerful tails about equal in length to the rest of
the body ; a newt has small slender limbs and a well
developed tail ; a lizard has fairly well developed
limbs and a tail of very slender proportions; an
alligator (crocodile) has strong short limbs and a

long powerful tail; a mammal usually has large long powerful limbs and a very small tail;

(e) the chief sense organs (eyes, nose, ears) of a vertebrate are all situated in the region of the head and not on the trunk or tail.

2.   Hydra is said to possess two 'germ-layers' in its development and the worm three.

(a) What exactly is meant by the term 'germ-layer'?

(b) Why should all the more highly organised animals, like the worm and frog, be formed from three germlayers? *i.e.*, what is the significance of the third germlayer in?

(c) Enumerate the organs produced from the third germ layer in the frog.

(d) Show that Hydra, though diploblastic, possesses the functional equivalents of these organs.

3.   Compare in broad outline the structure of the excretory organs of the worm with that of the frog's kidney. In what respects do they principally differ?

4.   (a) In a sketch of a transverse section of an earthworm in the intestinal region, indicate and name all the parts produced from a *single* coelomic sac of the embryo.

(b) Compare the conditions of the coelomic cavities in the worm and the frog.

5. (a) What is a portal system?

(b) Describe its form, its function and situation in the frog and rabbit.

(c) What is the use of an ordinary capillary system?

(d) How do the food and oxygen contents of the blood reach individual cells of the body?

6. (a) Trace in detail the exact course of a spermatozoon from the time leaves the seminiferous tubule of the frog's testis to the time when it unites with the ovum of the female.

(b) Describe in detail the structure of any spermatozoon and egg *which you yourself have seen,* and explain the uses of the various parts.

(c) Why, in view of the fact that in many *of the lower animals and plants the germ cells of the* two sexes are exactly alike, does a spermatozoon differ so much in size and shape from an egg, both being germ cells?

7. If you were to push a fine needle exactly in the median vertical plane through a frog's body dorso-ventrally in the hind region of the vertebral column, state fully and in their *proper order* the organs and cavities you would pierce.

8. The shoulder (pectoral) and hip (pelvic) girdles are serially homologous structures. Explain this statement as carefully as you can, and name and compare the serially homologous parts of the two girdles of the rabbit.

9.   Make a drawing showing the various structures to be seen in a thick transverse section across the hind (occipitoauditory) region of the frog's head and state from which germ-layer each structure has been derived.

10.   (a) Describe and figure all the obvious structures to be seen in the mouth cavity of the rabbit.

(b) What is the cause of a cough ?

(c) How is it that a smoker can inhale smoke and blow it out of his nose ?

(d) Can a smoker under any circumstances blow out smoke from his ears !

Second Paper

[*Answer* six *questions ; to the last question the most marks are attached. Diagrams to be carefully drawn.*]

1.   Describe carefully why the yeast plant is called an ' orgnized ferment '.

2.   Show by numerous examples that the division of a flower into four whorls cannot always be rigidly maintained.

3.   What are etiolated plants ? State their biological significance.

4.   Make a transverse section drawing of a pentarch non-medullated stele showing the commencement of secondary thickening.

How can a Monocotyledon and a Dicotyledon be usually distinguished in a transverse section ?

5. Describe the processes which lead to the conversion of an ovule into a seed and state what is the difference between albuminous (endospermic) and exalbuminous (non-endospermic) seeds, giving examples.

6. Distinguish the non-living from the living contents of a plant cell.

7. What plants are characterized by—

   (a) syngenesious stamens ;

   (b) a spathe ;

   (c) velamen ;

   (d) an intra-marginal vein in the leaf ;

   (e) latex ;

   (f) aerial roots ;

   (g) tetradynamous stamens :

   (h) corymb ?

8. What is respiration, and how is it affected (a) by heat, (b) by light, (c) by increased rapidity of growth ?

Two lots of peas, one of which had been soaked in water at 100°C, the other in water at 15°C., were passed up into the vacua at the top of two parallel tubes of mercury. How would the height of the mercury column be affected in each case ?

Would the after addition of caustic potash solution make any different to the height of the column ?

BIOLOGY—1917

First Paper.

[Answer not more than FIVE *questions.   Illustrate your answers with simple diagrams wherever possible]*.

1.   What is implied by the biological term 'irritability'?   How would you demonstrate that *Amoeba* and an earthworm are irritable, and by what means is the response brought about in the two animals?

2.   How does a hydra move, and what enables it to accomplish movement?   Where exactly would you expect to find *Hydra*, and what food would you provide it with in captivity?

3.   Describe the egg and spermatozoon of the earthworm.   How is fertilization brought about in this animal, and where does the egg undergo development?

4.   What do you mean when you say an animal is coldblooded?   How is the temperature maintained in warm-blooded animals?   Write a few notes on the corpuscles found in frog's blood.

5.   What kinds of tissue would you expect to find in the liver of the rabbit, and what work is performed by each kind?

6.   What is the function of the Eustachian tube?   If this passage be obstructed, what would be the effects?   In the close vicinity of a loud explosion people usually either cover their ears or open the mouth; why?

7. Explain the functions of a skeleton. Describe the various tissues which may form skeletal structures.

8. Enumerate the distinctive characters of the mammalia. What anatomical features of the rabbit would help you to conclude that the animal was a vegetable feeder ?

9. Explain what is meant by describing an action as ' reflex.' Explain the mechanism which brings about a reflex action, and by examples contrast it with a voluntary action.

10. What do we mean when we speak of a ' reduction division,' and what is the significance of the process ? Explain the reduction division in the germ-cells of the frog.

Second Paper

[Answer six *questions only. Use plenty of diagrams.]*

1. Some grains of barley are boiled in water for some time ; the water is filtered off and then tested for the presence of sugar, and none is found. Other grains of the same barley are planted, and when they have put forth a shoot and root they are boiled in water and the water tested for sugar, which is found to be present. Explain this, illustrating where the sugar has come from and the method of sugar-formation in plants generally.

2. Describe and contrast very carefully the method of origin of the cambium and secondary

growth in the stem and root of a Dicotyledon. Make large diagrams to show different stages of the same in stem and root respectively as seen in transverse sections.

3. Show plainly that the Fern plant in its life-history is twice reduced to a single-celled form. Describe fully the structure and appearance of these one-celled forms.

4. What are the uses of leaves to plants ? Give instances of plants with which you are acquainted that either have no leaves or only greatly reduced leaves, and show how they exist under these conditions.

5. Give an account of the different means employed by flowers to attract insects. Also explain the structure of any 'insect-trap' flower with which you are acquainted. Why should flowers want to attract and sometimes trap insects ?

6. What is cork ? Describe its method and place of formation.

7. Write brief notes on and give instances in each case of plants showing the following characters :—

    (a) drip-tip leaves ;

    (b) wind-pollinated flowers ;

    (c) bulbils ;

    (d) catkins ;

    (e) gamopetalous corollas ;

(f) winged seeds ;

(g) saprophytism ;

·(h) stipules.

8.   Briefly describe the wild flowers that you
have found on any botanical excursion you may
have made, and give to them their botanical names.
In any three cases show how the plant was specially
suited to live in the position in which you found it.

BIOLOGY—1918

First Paper
Zoology

[FIVE *questions only to be answered.*]

1.   Explain fully in clear language what you understand by the principle of the physiological division of labour and the correlated differentiation of structure, giving reasons for and illustrations of the facts upon which this principle is founded.

2.   Describe the development of the brain of a frog, indicating clearly all the principal parts (including cavities) derived from the three primary brain vesicles.

3.   What chemical elements usually constitute living matter? How would you demonstrate the truth of your answer? Give practical details of the experiments you would perform. Give a brief account of those features of their chemical elements which may affect the properties of living matter.

4.   If you were given a single vertebra, how would you tell with certainty the anterior end from the posterior.

How does a cervical vertebra of a rabbit differ from one taken from the thoracic region of the same animal? Compare these last two vertebræ in detail, describing homologous parts Taking the third or fourth vertebræ of a frog as a type, what differences are to be found in the other vertebræ of the frog's vertebral column?

Is the urostyle to be regarded as a group of fused vertebræ or a region of the backbone which has never become segmented into vertebræ.

5.   Draw as accurately as possible a thin transverse section across the body of a frog in the region of the hind end of the kidneys, putting in all organs, vessels, nerves, ducts, bones muscles and other parts present.

6.   Devise experiments to prove that an earthworm is sensitive in different degrees to light of different colours.

In what way does a worm become aware of an approaching enemy ? Describe the "home" of a worm and the devices it adopts to protect itself from its enemies.

How would you proceed to obtain worm embryos in different stages of development ?

7. In which phyla are the following animals placed :—

Flying Fox (the large Bat), Flea, Leech, Scorpion, Turtle, Centipede, Slug, Porcupine, a Caterpillar, the Ganges Dolphin. Give reasons for your classification in the case of each type of animal, and instance in each case two other widely different examples of the same phylum.

6. Describe carefully the structure of the ripe anther and how the various parts and tissues are formed.

7. In what ways does a young seedling plant differ from one (of the same size) obtained by putting a "cutting" in the ground?

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following animals :—earthworm, frog, and a mammal.

6.   Describe the structure of the " resting " nucleus.   State what you know of the physiological significance of the nucleus, and give a concise account of the process of mitosis.

7.   Explain clearly, by reference to the animals you have studied, what is meant by the following terms :—encystment budding, Malpighian body, metameric segmentation, symbiosis, conjugation, ductus Botalli, ductus endolymphaticus, corpus callosum, pleural sac or pleural membrane.

Second Paper.

Answer Five questions only.   Your answers should be *as full and clear as possible.*

1.   Describe the structure of the seed of the Caster Oil or Barley.   Make a large diagram to show the structure as revealed in a longitudinal section.   What happens to each part when growth commences ?

2.   Explain as carefully as you can the structure of a stoma.   What are the functions of stomata ? Explain any means by which these functions are controlled.

3.   In what respects do the frond of a fern and the leaf of a flowering plant resemble and differ from one another ?   What structure in the life-history

of the fern do you think to be comparable with the seed of a flowering plant ?

4. Name any six flowers, giving in each case their colour that you have seen visited by insects. In any one flower describe any parts that are especially modified in connection with insect visits. Do you know any flower that are not visited by insects, and in what respects do they differ from those that are ?

5. What organisms are capable of producing alcoholic fermentation ?   What experiment could you devise to see whether these organisms increased or decreased in weight during this process ?   What result would you expect to get ?

6. Describe a cell of Spirogyra so as to illustrate the essentials of cell structure.   Explain the use of the primordial utricle and of the vacuoles within the protoplasm.   Of what advantage is the spiral arrangement of the chloroplast ?

7. Give instances of the following, mentioning any points of interest therewith : —

(a) diœcious plants ;

(b) parts of plants modified to serve as floating organs ;

(c) seeds bearing hooks ;

(d) self-pollination ;

(e) prasitic flowering plants ;

(f) the association of plants and insects.

BIOLOGY—1920

First Paper.

N.B.—*Only* five *questions to be answered.*

In estimating the value of the answers, account will be taken of the mode of presentation. The answers must be clearly written and illustrated with simple diagrams.

1. Give a brief description of the manner in which reproduction is effected in Amoeba. Explain fully how this differs from the multiplication of normal tissue cells in the higher animals.

2. Describe the mode of locomotion in Amoeba, earthworm, and frog ; and show how it is adopted to the life of the animal in each case.

3. Waste and repair occur in all animals. What causes the former, and how is the latter effected ? How are waste products got rid of ? Prove the above statement, taking the frog as an example.

4. Compare in a typical case the process of " spermatogenesis " with " Oogenesis." What do you understand by the terms : — " Somatic number " and " reducing division " ?

5. What do you understand by the word " Protoplasm " ? Of what is it built up, and what is its origin ? Why is it said that " were it not for the existence of green plants all life on the earth would very soon come to an end "?

6. Describe and compare with one another the mechanism of respiration in a frog and rabbit.

with the help of drawings five different devices by which seeds (not fruits) are scattered.

6. What are the principal characteristics of the Fungi ? Illustrate your answer by references to mucor and yeast.

7. Describe the sporangium of a fern. By what mechanism are the spores liberated and disseminated ? What changes take place in these spores, when they are subjected to favourable conditions ?

8. Write brief notes on the following, and in each case give examples :—

(a) perigynous flower,

(b) septifragal dehiscence,

(c) bulbils.

(d) catkins,

(e) Phylloclade.

(f) pericarp.

8.   Write short notes on : —Contractile vacuole, Cnidoblast, Symbiosis, ductus Botalli, perigauglionic glands, ductus endolymphaticus, a medullated nerve fibre, Amphiaster, a typical cervical vertebra of the rabbit, and corpora qadrigemina.

SECOND PAPER

Question number 1 is compulsory. Out of the remaining seven questions attempt any FOUR. Illustrate your answers with neat and instructive sketches.

1.   Describe some simple experiments with the help of which you could demonstrate the importance of :—

(a) *Light* (b) *Chlorophyll* and (c) *Carbon dioxide* in Photosynthesis (Carbon assimilation).

2. (a) Comment upon the statement "without water there can be no plant life."

(b) Describe the methods of reproduction in *Mucor* and *Spirogyra*.

3.   Mention some familiar examples of anemophilous flowers. How do such flowers differ from those polinated by insects ?

4.   Write a short essay on "Propagation without seeds " in the Angiosperms.

5.   How would you detect under the microscope the presence of the following :—Lignin, Cellulose, suberin, starch and proteids ?

BIOLOGY.—1922

FIRST PAPER

Zoology

N.B.—FIVE questions only to be attempted.

1. Describe the gross and histological structure of the eye in the frog or other vertebrate.

2. How does a frog or toad drink, *i.e.*, take in water? Does the blood become thinner after a drink?

What is lymph? How is it produced in the body of a frog? Where is it stored and what is its use? Does lymph circulate in the body like the blood? If so by what means, and what course does it take?

3. What is a gastrula? Compare Hydra with a gastrula.

4. What are the chief morphological distinctions (other than the presence of absence of a vertebral column) between an insect and a vertebrate?

5. Describe exactly how fertilisation takes place in the case of a worm.

6. What parts does a centrosome play in the nitosis of an ordinary cell and a spermatozoon?

7. Describe the uses of the ten pairs of cranial nerves in the frog.

SECOND PAPER

1. Give an account of the principal structures seen in the transverse section of a dicotyledonous

Aspidium differs from a sunflower stem. Compare
the ornamental qualities of those two plants.

7. Compare the reproductive processes of
Spirogyra and Ulothrix. Why is Ulothrix supposed
to illuatrate the beginnings of sex differentiation ?

7. Define, giving instances, the following terms:—chromosome, contractile vacuole, nematocyst, rostome, axis cylinder, glomerulus, ductus Botalli, and glands of Swammerdam.

8. Give a general account of Spermatogenesis and Oogensesis. Compare the two processes, and mention any noteworthy features in the mitotic phenomena connected therewith.

SECOND PAPER.

Time—Three hours.

The last questions is compulsory. Out of the remaining you may answer any FOUR. *Illustrate your answers, where necessary, with neat diagrams.*

1. What are the various modes of *asexual* reproduction in the non-flowering plants?

2. Describe the structure in detail of the transverse section through a flower bud, the section passing through the middle of the ovary. Name the flower you describe.

3. Compare and contrast the life-history of Bacteria with that of Yeast. Give the economic uses, if any, of these two plant organisms.

4. In what essential respects does the life-history of a *fern* differ from that of a flowering plant?

5. What are the advantages of ' cross-pollination '? How can it be effected? What are the

Intermediate Examination Papers, 1909

ENGLISH HISTORY

(Only SEVEN *questions to be answered.)*

1. Describe briefly the chief political institutions of the early Saxons.

In what way did the struggle with the Danes modify these institutions?

2. What means did Henry II adopt to weaken the power of the barons?

3. Give an account of the various struggles with Scotland which took place in the reigns of the first two Edwards.

4. Trace the growth of parliament during the reigns of Henry III and Edward I.

5. Account for and describe the various insurrections which broke out in the reign of Henry VII.

6. What were the aims of Mary Tudor? Show that with such aims the struggles of her reign were inevitable.

7. What was the Thirty Years' War and how was England connected with it?

8. Give an account of the career and policy of the elder Pitt.

9. Describe the parliamentary career of Gladstone.

10.   Give a brief account of each of the following:—

The Star Chamber.   The Navigation Acts

The origin of the National   The Septennial Act.
  Debt.   The Congress of

The Treaty of Utrecht.   Vienna.

Or

GREEK AND ROMAN HISTORY

[Not more than FOUR *questions in each part to be attempted, nor more than* SEVEN *in all].*

A

1.   "Disunion was the vice of Greek politics." Illustrate this statement from Greek History.

2.   Give a brief account of the following:—

Solon—Miltiades—Ostracism—The Confederacy of Delos—The Thirty Tyrants.

3.   Describe the second Persian expedition against Greece.

4.   Describe (1) the constitutional changes introduced by Pericles, (2) his foreign policy.

5.   Sketch the career of *either* Themistocles *or* Philip of Macedon.

B

6.   Account for the failure of Hannibal in his struggle with Rome.

7.   Describe the aims and legislation of Tiberius Gracchus.

8. Give a brief account of Spurius Cassius—
Fabius Cunctator—Verres—Julian the Apostate—
Attila.

9. Sketch the career of Cicero.

10. Give an account of the life and reign of
Trajan and contrast his rule with that of the Flavian
Emperors.

HISTORY—1910

[SEVEN *questions only to be attempted.*]

A

1.   Sketch the history of the settlement of the Anglo-Saxons in Britain. Illustrate your answer by a map showing the limits of their settlements, and the chief kingdoms founded by them.

2.   To what extent did William I maintain English institutions? Discuss his principal innovations.

3.   Give a brief account of the social conditions of England in the reign of Richard II.

4.   Indicate the difficulties with which Henry VII was confronted, the measures he took to overcome them, and the extent to which he was successful.

5.   Discuss the causes that led to the execution of Mary, Queen of Scots.

6.   Give a short account of Louis XIV's relations with England.

7.   Give an account of the services rendered to England by Walpole and the elder Pitt.

8.   Show clearly, by means of a map, the stages in the growth of the British Empire in North America, marked by the following dates—1713, 1763, 1783.

9.   Give some account of the changes in the methods of Industry and Agriculture which took

place during the Eighteenth Century. How far may the social distress of the period 1815—30 be attributed to them ?

10. What was the Holy Alliance ? Describe the attitude of English statesmen towards it.

<u>c</u>   *Or,* **B**

[*Not more than* FOUR *questions in each part to be attempted, nor more than* SEVEN *in all.*]

I

1. Trace and illustrate the influence of geographical conditions on the social and political development of the Greeks.

2. Describe the changes made by Cleisthenes in the constitution of Athens.   Explain their object.

3. Compare the part played by Athens and Sparta respectively in the struggles with the Persians.

4. Explain clearly the terms : Timocracy, Tyranny, the Ephors ; and given short accounts of Kylon, Cyrus the Younger, Gylippus.

5. Sketch the history of the Peloponnesian war down to the peace of Nicias.

II

6. What were the disabilities of the plebeians ? How were they moved during the struggle with the patricians ?

7.   Write brief notes on : the Gabinian Law, Pyrrhus, M. Livius Drusus, Vercingetorix, the revolt of Civilis, the first Triumvirate, the Prætorian guard.

8.   Sketch the struggle between Cæsar and Pompey from the crossing of the Rubicon to the death of Pompey.

9.   What is meant by the Principate? How far was it a restoration of the old republican constitution ?

10.   To what dangers was the Roman Empire exposed ? What attempts were made to overcome them and with what success ?

HISTORY—1911

ANCIENT HISTORY AND ALLIED GEOGRAPHY

First Paper

(Up to 146 B. C.)

[*Not more than* SEVEN *questions to be answered. Questions* 1 *and* 7 *must be attempted.*]

1. Show how the geographical features of Greece promoted (*a*) internal disunion, (*b*) commercial enterprise, (*c*) relation with the East.

2. Narrate briefly the development of Spartan supremacy over the Peloponnesus. Illustrate by a sketch-map of the Peloponnesus.

3. What causes led to the foundation of the Greek colonies ? Describe their extent. How did they differ from those of the other nations ?

4. Account for the failure of Athens in her struggle with Sparta.

5. Describe precisely the position of the following places :—Ægina, Artemisium, Naupactus, Byzantium, Elateia, and illustrate their historical importance.

6. How was the Empire of Alexander divided after his death ?

7. Sketch a map of Sicily, inserting the names of the chief places. Explain how its geographical situation affected its fortune during this period.

8.   Write brief notes on—Coriolanus, the military tribunate Caudine Forks, the dictatorship Antiochus the Great.

9.   Give a brief account of the Third Punic War, stating the causes which led to it.

10.   How was the internal condition of Rome affected by her wars with the great power outside Italy.

ANCIENT HISTORY AND GEOGRAPHY

SECOND PAPER

(Period 146 B. C. to 476 A. D.)

[Not more than SIX *questions to be answered.   Of questions Nos.* 3, 7, *and* 9, *at least* ONE *should be attempted.]*

1.   Give some account of the Gracchi their aims, methods, and achievements.

2.   Trace the steps by which Julius Cæsar gained supreme power at Rome.

3.   Describe briefly the system of provincial government under the Republic ; point out clearly the changes made by Augustus in that system (illustrating your answer by a map), and estimate the effect of those changes.

4.   ' The rule of Claudius left a deed and abiding mark on the history of the Empire.' (PELHAM).

Explain and illustrate this statement.

5. 'Hadrian is one of the few representative in antiquity of the modern principle that the Prince is the first servant of the State.' (KOCH.)

What do you know of Hadrian and his reign to justify this statement?

6. What changes were made by Diocletian in the organization of the Empire?

7. Give some account of the tribes that overthrew the Western Empire, illustrating your answer with a map.

8. Point out briefly the importance of the following persons in the history of their time :—

Marius ; Marcus Antonius ; Vespasian ; Constantine the Great ; Stilicho.

9. Draw a map of Italy marking twenty places of importance in the history of your period, and state (where possible) geographical reasons for the importance of each place.

MODERN HISTORY AND ALLIED GEOGRAPHY
FIRST PAPER
(1526 - 1707)

[Not more than SEVEN questions to be answered. Questions 1 and 4 must be attempted.

1. Draw a rough map to illustrate the principal political divisions of India at the time of the invasion of Babar. Show what changes had occurred by the time of the death of Akbar.

2.   What causes led to the expulsion of Humayun from India ?

3.   Give a brief account of the Portuguese settlement in India.

4.   State the geographical reasons why important battles were fought during this period at Panipat, Samugarh. and Ajmere.

5.   What do you know of the reign of Jehangir ?

6.   Explain the difficulties of the English settlements in India during the seventeenth century.

7.   State what you know of the administrative system of the Mogul Empire under Aurangzeb.

8.   Write brief notes on—Todar Mal, Bairam Khan. Mir Jumla Shaista Khan, Kandahar.

9.   *Either*, (*a*) Describe the fall of Golconda.

Or, (*b*) Discuss the statement that ' Aurangzeb cannot be pronounced a successful ruler.'

MODERN HISTORY AND ALLIED GEOGRAPHY
FIRST PAPER

(From 1707)

[*Not more than* SEVEN *questions should be done. Question No. 6 should be attempted.*]

1.   Give a brief sketch of the career of Dupleix.

2.   Describe the events in Bengal which led up to the battle of Plassey.

3.   Give an account of Clive's second governorship.

4.   Describe the events leading up to the Treaty of Salbai.

5,   What was the policy adopted by Lord Wellesley in dealing with the native states ?

6.   Draw a map of India 1795, making the British dominions and the principal native states.

7.   Give an account of the causes and progress of the first Afghan War.

8.   State briefly for what each of the following places is famous :—Wargaon, Buxar, Seringapatam, Gwalior, Panipat, Cochin, Pondicherry, Bassein, Purandhar, Wandiwash.

9.   Give some account of the development of means of communication in India in the second half of the nineteenth century.

ENGLISH HISTORY

FIRST PAPER

(SEVEN *questions only to be attempted.*)

1.   Give a brief sketch of the Roman occupation of Britain, mentioning the improvements they effected.   Draw a map to illustrate your answer.

2.   Briefly describe the local organisation of England in the tenth century, and give reasons for any social changes that took place in that period.

3. What administrative reforms were carried out in the reign of Henry I ?

4. ' At his accession Henry II was the monarch of greatest consequence in Europe.' Explain this. What troubles had he to face at the beginning of his reign ?

5. Trace the growth of Parliament in the latter half of the thirteenth century.

6. Give an account of the part played by monks and friars respectively in the religious life of the Middle Ages.

7. Discuss any economic changes which took place in England during the reigns of Edward III and Richard II.

8. Survey the chief events of the Hundred Years' War, stating the causes which led up to the war. Draw a map to illustrate your answer.

9. Show how far the immediate successors of Henry VII succeeded in carrying out his domestic policy.

10. Describe England's relations with Spain during the Tudor period.

SECOND PAPER

(Not more than SEVEN *questions to be answered.)*

1. " The increase of the people has been great in every part of the kingdom, but generally much greater in the Northern than in the Southern

shires." (*Macaulay*).   How do you account for this latter fact ?   Illustrate your answer by reference to particular localities.

2.   Give an account of the career and aims of Strafford.

3.   Describe briefly the various forms of government that were tried in England between the death of Charles I and the Restoration of Charles II.   What causes led to the Restoration ?

4.   Give an account of the Act of Settlement, and estimate its importance.

5.   Show how England come to be involved in European wars during the reign of Queen Anne, and describe briefly the leading campaigns of her reign.   Draw a rough map to show the principal centres of war in this reign.

6.   State clearly (with a genealogical table) how it was that the House of Hanover came to rule over England.

7.   Describe concisely the origin and progress of the Jacobite movements in the 18th century, and account for their eventual failure.

8.   " We buried him darkly at the dead of night,
     The sods with our bayonets turning :
     By the struggling moonbeam's misty light
     And the lantern dimly burning."

Describe clearly (with a rough map) the events that led up to this incident, estimating the importance of the campaign in the struggle with Napoleon.

9.   Give an account of the movement which resulted in the abolition of the corn laws.

10.   *Either* (i) Describe the career and policy of Disraeli *or* (ii) Summarize the growth and expansion of the British Empire during the reign of Queen Victoria.

MODERN HISTORY—1912

FIRST PAPER.

[Not more than SIX questions to be attempted. Two questions at least should be done out of the FIRST THREE.]

1. State the causes of Babar's invasion of India, and trace the stages of his conquests. Illustrate your answer by a map.

2. What geographical reasons were there for the importance of the following places during this period:—Burhanpur, Kandahar, Surat, Rhotas (Punjab), Rajmahal? Mention at least one historical event connected with each.

3. Give a clear account of the fight for the throne between Aurangzeb and his brothers. Give a rough map to illustrate your answer.

4. Describe the revenue system of Akbar.

5. *Either* (a) Give an account of Aurangzeb's relations with the Rajputs, *Or* (b) Discuss Aurangzebe's 'standard of kingly duty and his theory of the education of princes for the responsibilities of government.'

6. Write brief notes on—Sir Josiah Child, Asirgarh, Khan Jehan Lodi, Ain-i-Akbari, Tara Bai.

7. State clearly what causes led to the foundation of Dutch trading settlements in India.

8. What attempts were made to deprive the East India Company of its monopoly of trade between England and India ?

SECOND PAPER.

[Not more than SIX *questions should be attempted. Question 5 must be attempted]*

1. Sketch briefly the most important aspects of the reign of Muhammad Shah.

2. Describe the part played by Mysore in the wars between the English and French.

3. 'Hastings was the administrative organizer, as Clive had been the military founder, of our Empire.' Discuss this statement.

4. What do you understand by 'non-intervention'? At what periods, and with what results was this policy adopted ?

5. 'The map of India as thus drawn by Lord Hastings remained substantially unchanged till the time of Lord Dalhousie.' Draw a map illustrating the extent of British dominion in India at the time of Lord Hastings' resignation, and explain the circumstances of Lord Hastings' annexations.

6. Trace the steps which led to the annexation of the Punjab.

7. Describe the social and economic changes which were going on in India in Lord Dalhousie's time.

8. Mention the chief sources from which the revenue of India is derived. Distinguish between gross and net revenue.

9. Account for the growth and importance of the following places under British rule :—Calcutta, Karachi, Lyallpur, Rawalpindi, Cawnpore.

SUPPLEMENTARY INTERMEDIATE EXAMINATION
MODERN HISTORY
First Paper

[*Not more than* six *questions to be answered. Qustions at least should be done out of the* FIRST THREE.]

1. Give a full account of the career of Aurangzebe up to the beginning of the fight for the throne. Illustrate your answer with a map.

2. Account for the historical importance of the following places during this period :—Kalinjar, Jinjira, Chunar, Ormuz, Ujjain. State the geographical reasons for the importance of each.

3. Describe in datail the history of the Dutch settlements in the East during the 17th century, and draw a map to illustrate your answer.

4. What do you know of the reign and character of Humayun ?

5. State and discuss Akbar's relation with the Rajputs.

6. *Either* (*a*) Explain clearly the mansab and jagir system in force in the reign of Aurangzebe, *Or* (*b*) Account for Aurangzebe's ' colossal failure ' in the Deccan.

7.   Write brief notes on—Albuquerque, Jaswant Singh, Hemu, the Satnamis, Courten's Association.

8.   State and explain the circumstances that led to the Union of the Companies (1702—1708).

SECOND PAPER

[*Not more than* SIX *questions to be attempted*]

(*All candidates should attempt question 3 and at least one of the questions 1 and 2.*)

1.   Draw a map of the Madras Presidency. Mark clearly the districts added at different times. Write *brief* notes on the stage of its growth.

2.   Draw a map of the Ganges valley to show the following places :—Patna, Murshidabad. Buxar, Chinsura,   Plassey and Chandernagore.   Write a *brief* historical note on each.

3.   Give some account of the most important steps taken to secure the North-Western Frontier. Illustrate your answer by means of a map.

4.   Clearly describe the events leading up to the battle of Panipat ; 1761.

5.   When, and why, was Burmah annexed ?

6   Describe the relations existing between the East India Company and Oudh, during the period 1765—1805.

7.   Give a summary of the Queen's Proclamation of November 1st, 1858.

8.   Explain the exact meaning of—Public Debt, Home Charges, Exchange.

ANCIENT HISTORY & ALLIED GEOGRAPHY

First Paper

Period—Up to 146 B. C.

[*Not more than* SIX *questions to be answered. Questions 3 and 9 must be attempted.*]

1.   Describe briefly the course of events which brought the Greeks into collusion with the Persians.

2.   Describe the extent of the Athenian Empire between the Persian and Peloponnesian wars. What were the elements of its strength and weakness.

3.   Draw a map of Attica and her immediate continental neighbour, inserting the chief physical features and places of political importance.

4.   Describe precisely the position of *five* of the following places :—Coronea, The Eurymedon, Potidaea, Deceleia, Issus, Kynaxa, The Halys ; and explain their historical importance.

5.   Sketch briefly the career of Agesilaus.

6.   Explain by reference to geographical and other consideration why Rome unified Italy, while no Greek power unified Greece.

7.   Write brief notes on—the Valerian law of appeal, Tribunate, Pydna, the Latin Franchise, Mummius.

8.   Sketch the progress of the Second Punic War from the crossing of the Alps by Hannibal to the battle of Cannae.

6.   Explain the term Province. What provinces belonged to Rome in 146 B. C. ? State briefly what events led to their acquisition.

10.   Illustrate the importance of sea power in the history of Rome during this period.

SECOND PAPER

Period—146 B. C. to 476 A. D.

[*Not more than* SIX *questions to be answered. Of questions* 2, 3, *and* 9, *at least* TWO *should be attempted.*]

1.   Sketch the career *either* of Sulla *or* of Pompeius Magnus.

2.   Give an account of Julius Cæsar's conquest of Gaul, adding a map to illustrate your answer.

3.   State the circumstances which led to the war between Octavius and Antony, and give an account of the war, with a map.

4. . Compare   and contrast the work which Trajan and Hadrian did for the Empire. ·

5.   Trace the growing influence of the army under the Empire.

6. What claims has Constantine to the title of ' Great ' ?

7. Give some account of the dangers from without by which the Emperors were constantly threatened.

8 Write notes on—Saritorius, Cicero, Munda, Sejanus, Marcus Aurelius Antoninus.

9. Describe *precisely* the position of *five* of the following places, and explain their historical importance :—Aquileia, Dyrrhachium, Antioch, Alexandria, the Rubicon, Hadrian's Wall, Carrhae.

MODERN HISTORY AND ALLIED
GEOGRAPHY—1913

FIRST PAPER

[Answer questions 1 and 2, and any other FOUR.]

1.   Draw a map of India and indicate (*a*) the political divisions of the continent at the date of Akbar's accession, and (*b*) the European settlements at the date of Aurangzeb's death ; after the name of each settlement write in brackets the initial letter of the country to which it belonged.

2.   Write a sketch of the career of Sivaji. Make a rough map to show the extent of his possession at the time of his death, and on the map *name* the various territories and jaghirs.

3.   What difficulties had Akbar to contend with in Hindustan after his father's death ? Describe the steps he took to overcome them, and show to what extent he was successful.

4.   Write an account of life at the Moghul court in the reigns of Jahangir and shah Jahan, as described by contemporary European travellers.

5.   Describe the early difficulties of the English East India Company. Compare its business methods with those of the Dutch Company, and account for the superior strength of the latter company.

6.   Explain why the English, rather than the Portuguese and Dutch, gained a firm foothold in India.

.7. Write short notes on *three* of the following :—
Chitor, Gerald Angier, Samugarh, the Peshwa, and
Thomas Pitt.

8. Account for the disasters of Aurangzeb's
final years.

SECOND PAPER

[Six *questions only to be answered, of which* ONE *at
least should be taken from the* FIRST THREE.]

1. Write a brief account of the decline of the
Mogul Empire 1707—1805, illustrating your answer
with a map.

2. Sketch the career and policy of Dupleix and
draw a map of South India to illustrate the wars be-
tween the English and the French.

3. Mention the principal wars on the North-
West frontier of India during the ninteenth century
State briefly the chief reasons for each of these and
draw a map to illustrate your answer.

4. Write an account of the career of William
Pitt, the Great Commoner.

5. Describe Clive's second governorship. What
were his principal difficulties ?

6. Explain the circumstances that led to the
annexation of Lower Burmah.

7. State clearly what is meant by the Doctrine
of Lapse. How far did Lord Dalhousie enforce it ?
What is the present policy of the Government of
India in similar cases ?

8. What did Lord Dalhousie do to develop means of communication to India ?

9. Write a brief summary of the progress of India under Queen Victoria.

10. Give an account of the principal events and reforms of Lord Curzon's administration.

11. State what you know of *three* of the following :— The Ostend Company — Benoit Dumas— Chitu—Shah Shuja—King Thebaw.

12. Explain briefly the historical importance of *three* of the following :—The Regulating Act— The Renewal of the Charter—The Khalsa—The Peshwa.

ANCIENT HISTORY AND ALLIED GEOGRAPHY

FIRST PAPER

[SIX *questions only to be answered. Either question 1 or question 9 must be attempted.*]

1. Draw a map of the Peloponnesus showing the principal states and Argos, Mount Taygetus, Megalopolis, Messene, The Eurotas, Pylos, Mantinea.

2. What do you understand by Democracy ? Describe the institutions by which democratic government was secured in Athens.

3. Discuss the causes of the Peloponnesian War.

4.   Describe the relations existing between Thebes and (a) Sparta, (b) Athens, during the period 431—362 B C

5.   Give a short account of the career of Philip of Macedon.

6.   Recount briefly the steps by which Rome became mistress of Italy.   Illustrate your answer by a map.

7.   Explain the policy of Rome towards Greece and Macedonia.   How did it differ from her policy towards the States of the West ?

8.   Write brief notes on—A. U. C. ; Lex Hortensia ; Via Flaminia : the first secession of the Plebs ; Lex de repetundis.

9.   Describe exactly the geographical position of *five* of the following places, and write a *brief* historical note on each — Amphipolis.   The Granicus, Lilybaeum, Cnossus, Massilia, The Trebia.

Second Paper

[Six questions only to be answered, among which questions 2 and 9 must be included.]

1.   Briefly sketch the career of Marius.

2.   Describe the contest between Julius Caesar and Pompeius.   Illustrate your answer with a

3. *Either,*

(a) Explain the legal position of the Princeps. Upon what legal bases did his power nominally rest ?

Or,

(b) Describe the events which led up to the formation of the second triumvirate.

4. Sketch the course of events from the abdication of Diocletian to the attainment of supreme power by Constantine.

5. *Either.*

(a) Give some account of the position of the Senate under the Julian Emperors.

Or,

(b) Give a description of the reign and character of Tiberius.

6. ' The title of Great was better deserved by Theodosius than by Constantine ' Discuss this statement.

7. Describe the final collapse of the Western Empire.

8. Write a few lines about each of the following :—Stilicho, Crassus. Julian. Marcus Antonius. Catiline.

9. Give the precise position and explain the historical importance of the following places :— Actium, Jerusalem, Philippi. Carthage, Ravenna. Byzantium.

MODERN HISTORY — 1914

First Paper

[N. B.—*Only* six *questions to be answered.*]

1. 'Sher Shah Sur was one of the greatest rulers that India has known.' What did Sher Shah do to justify this statement ? Give a brief account of his reign and of his Suri successors.

2. Describe briefly the character of the Emperor Jahangir.

3. 'Shahjahan's court was the most magnificent that India has ever seen, and in his reign the Mughal Empire, if not quite at its greatest extent, was without doubt at its greatest glory.' Give a concise account of the court, and mention some of the works of that monarch.

4. Draw a sketch-map of the Deccan, showing the chief political divisions at the close of the six- *teenth century.* *Give a short account of the growth* of the Mughal power in that region from the time of Akbar up to the death of Shahjahan, noting the names of the ruling dynasties of the country during that period.

5. Describe shortly the military system of the Mughals.

6. To what causes would you attribute the ulti- mate failure of Aurangzeb's policy and campaigns in Southern India ?

7. Give a short account of the life and exploits of Albuquerque.

8. Describe the steps that led to the incorporation of the first East India Company.

9. Draw a map showing the position of each of the following, and state briefly with what events they are associated in history :—Kanwa; Daulatabad; Diu; Khajwa; Amboyna; Aurangabad; Surat; Arakan.

10. What do you know of the following persons:—Sir Thomas Roe ; Nur Jahan; Joy Charnock; Afzal Khan ; Vasco da Gama ; Murad Baksh ?

SECOND PAPER

[N.B.—*Only* SIX *questions to be answered. At least* ONE *of the* FIRST THREE *questions must be attempted.*]

1. Give a brief sketch of the rise and fall of the Emperor Farrukhsiyar.

2. Who was Nadir Shah. and what were the causes of his invasion of India ?

3. Describe briefly the events of the life of Prince Ali Gauhar up to the time of his accession as the Emperor Shah Alam.

4. Describe the origin of the ' Seven Years' War' and the chief events which took place in it, with special reference to India.

5 What do you understand by the ' Industrial Revolution' ? By what great changes was it characterized in England ?

6. Give some account of the first three Pesh-was.

7. What justification was there for the Marquis of Wellesley's belief that the British power in India was in danger from the French during his time? In giving your answer, briefly sketch the events that were taking place at the time in Europe.

8 ' If the foundations of the system of civil administration had been laid by Hastings, the superstructure was raised by Cornwallis.' Discuss this statement, noting what reforms were carried out by Warren Hastings, and what by Lord Cornwallis in the system of civil administration

9. What part did Lord Dalhousie play in the advancement of education in India? With which of his successors is educational reform chiefly associated, and what did they do for this cause.

10. Describe concisely the most important changes that have taken place in the constitution of the Indian Government from the time of the appointment of Warren Hastings up to the present day.

11. Draw a map to illustrate where the following places are, and give a succinct account of events associated with each:—Twenty-four Parganas; Seringapatam; Multan; Satara; Miani; Bassein; Manipur; Panjdeh; Rangoon; Bharatpur.

12. What do you know of the following:—Colonel Goddard; Mir Kasim; the Pindaris; Hector Munro; General Ochterlony; Chet Singh; Eyre Coote; Dost Muhammad?

ANCIENT HISTORY AND ALLIED GEOGRAPHY

FIRST PAPER

[Not more than SIX questions to be answered. Questions 2 and 5 must be attempted.]

1. Explain what is meant by (a) Aristocracy, (b) Democracy. Exemplify the essential points of difference by comparing the constitutions of Greek States.

2. Give reasons for the lack of cohesion amongst the Greeks in the face of a common enemy. Draw a map of Greece to illustrate your answer.

3. Sketch the part played by Pericles in the history of Athens.

4. How far did the Greeks hellenize the Italian peninsula.

5. What were the various steps by which Rome obtained the mastery over all Italy? Illustrate your answer with a map.

6. Examine the causes of Rome's ultimate victory over Carthage in their great struggle.

7. Briefly describe the part played by the Scipios in the history of Rome.

8. Give the dates, combatants, and results of the battles of—Arginusae, Issus, Sentinum, Zama, Magnesia.

9. Write brief notes on four of the following:—Amphictiony, Ostracism, Cleruchies, XII Tables, Latifundia, Comitia Tributa.

SECOND PAPER

[Not more than SIX *questions among which questions
5 and 10 must be included, should be attempted.]*

1.   What changes did Sulla make in the Roman
constitution ? How far were they permanent ?

2.   Describe the causes and progress of the
Catilinarian conspiracy.   Why was Cicero criticized
for his way of dealing with it ?

3.   Account for and illustrate the political pro-
minence of the Tribunate during the last century of
the Republic

4.   Explain the points at issue in the struggles
over (*a*) the Agrarian Question, (*b*) the Italian
Franchise.

5.   What additions were made to the Roman
Empire after 27 B. C. and under what Emperors ?
How far were they permanent ? Illustrate by a
sketch-map of one of the 9 Frontiers.

6.   Describe the improvements effected in the
administration of the Provinces under Augustus.

7.   Give an account of the reign of Diocletian
and of his reorganization of the Empire.

8.   Illustrate the part played by the legions in
the government of the Empire.

9.   Write brief notes on *four* of the following :—
Verres, Spartacus, Ariovistus,   Varus, Agricola,
Titus, Civilis, Alaric.

10.   Describe as exactly as you can the position
of *four* of the following places :—Numantia, Alesia,
Pontus, Thapsus, Misenum, Massilia, Camulodunum,
Palmyra, Adrianople.

MODERN HISTORY—1915

First Paper

[Answer questions 1 and 2 and any FOUR *of the others].*

1.   Draw a map, showing in outline the divisions of India at the time of Babar's invasion.

2.   Trace any connexions that you can find between the history and the geography of India during the period 1526—1707.

3.   Give some account of the internal administration of Akbar. Can you offer any criticism of it?

4.   What are the main features of Mughal architecture? Mention the chief buildings constructed in Shahjahan's reign and describe one of them.

5.   To what extent were the Mughals supreme over the whole of India? Illustrate your answer with special reference to Akbar's time.

6.   Write a short account of the reign of Jahangir.

7.   Give a sketch of the national characters of the various peoples of India at Aurangzeb's accession.

8.   Write a short history of the Marathas during the period 1526—1707.

Second Paper

[Answer questions 1 and 2 and any FOUR *of the others.]*

1.   Draw a map of India, showing its main divisions in 1848.

2. Give some account of the territorial changes which were made during Lord Dalhousie's administration.

3. Write a short history of the European settlements in India up to 1746.

4. What do you know of the struggle of the French and English in India ?

5. Explain, with examples, the differences between Whigs and Tories in England.

6. Explain the following :—Democracy, Parliamentary Reform, Socialism, Corn Laws.

7. Illustrate the importance of sea-power from the modern history of England and India.

8. Give some account of the organization of the Government of the Punjab as settled by Lord Dalhousie.

9. The Government of India is sometimes described as a ' bureaucracy.' What does this mean? How far is the Government of India representative ?

ANCIENT HISTORY

First Paper

[Six *questions only to be attempted*, THREE *from each section. Either question 8 or question 10 must be attempted.*]

A

1. Draw a map, showing the Greek colonies west of the Adriatic. What were the causes leading to colonial expansion among the Greeks?

29

2. What was the part played by Tyrants in the political development of Greek States? Illustrate your answer by reference to Athens.

3. What effects had the Persian Wars upon Greece?

4. Show the importance of sea-power in the Peloponnesian War.

5. Account for the rise and fall of Theban supremacy.

6. Trace the steps by which Greece came under the sway of Macedon.

B

7. What was the Latin League, and how did it influence the history of Rome?

8. Describe the grievances of the Plebeians. How far, and by what means, were they removed?

9. Give the causes, direct and indirect, which brought Rome into contact with Carthage.

10. Draw a sketch-map, showing the Roman possessions about 146 B.C. State briefly when and how the provinces outside Italy were secured.

11. Write short notes on any *three* of the following:—(a) Cannae, (b) Pyrrhus, (c) The Aetolian League, (d) Decemvirs, (e) The Dictatorship.

SECOND PAPER

[SIX *questions only to be answered, among which questions 2 and 9 must be included.*]

1. What is the historical importance of any *four* of the following:—Viriathus, Jugurtha, Aquae

Sextiae, Corfinium, Sertorius, Spartacus, Munda, Actium ?

2. Describe Julius Cæsar's conquest of Gaul, and explain in what way his position was unconstitutional. Draw a map of the Mediterranean and the adjoining countries, and insert the names of the Roman provinces acquired before 59 B. C.

3. Describe the rise of Octavius to supreme power, and give reasons why the rule of one man was inevitable at that time.

4. State and criticize the attempted reforms of Caius Gracchus, explaining the cause of the subsequent disturbances.

5. Describe the chief features of Hadrian's rule, showing how his administration differed from that of his predecessors.

6. Give a brief account of the character of Marcus Aurelius, and of the condition of the Roman Empire at his time.

7. Write an account of the career and reign of Constantine.

8. Give a short note on any *four* of the following :—Mithridates, Cinna, Cleopatra, Maecenas, Germanicus, Titus, Agricola, Odoacer.

9. State the chief reasons for the fall of the Roman Empire, and what you consider to be the benefits which Europe has derived from Roman rule.

MODERN HISTORY—1916.

First Paper

[Answer questions 1 and 2 and any FOUR *of the others.]* .

1.   Draw a map of India, making thereon (*a*) the sites of the principal decisive battles which were fought during the period 1526—1761, (*b*) the dates of those battles, and (*c*) the chief geographical features which influenced the course of the campaigns of which the battles formed part.

2.   Give an account of the growth of the Moghul dominions from Babar to Aurangzib.

3.   What qualities were shared by the Moghul emperors from Babar to Shah Jahan, and what memorials of those qualities are to be found in India to-day ?

4.   ' To retrieve the growing effeminacy of the Mughals, to attach or curb the Rajputs, to check the tendency of provincial governors to...found dynasties.' How far were these objects achieved by Aurangzib ?

5.   Estimate the ability of Aurangzib as a soldier.

6   Give some account of the financial administration of the empire under Aurangzib.

7. ' Their memorials (*i.e.*, those of the Portuguese) are the epic of the Lusiad, the death-roll of the Inquisition, and indigent half-caste population, and three decayed patches of territory on the Bombay coast.' Explain, using your knowledge of

the history of the Portuguese settlement, the mean-
ing of this statement.

8.   Describe the development of the Mahratta
power from 1720 to 1761.

9.   Who was responsible for the failure of the
French to establish an empire in India ?   State
reasons for your answer.

SECOND PAPER

[Answer questions 1 and 2 and any FOUR *of the
others.]*

1.   Give an account of Lord Lake's campaign
of 1803, illustrating by a map.

2.   Explain how far the boundaries of the pre-
sent provinces and state within the Empire of India
have been determined by geographical influences.

3.   Explain clearly what was ment by the
' Doctrine of Lapse.' To what states and upon what
principles was it applied by Lord Dalhousie ?

4.   ' We are making a nation.'   Show how Lord
Dalhousie's policy in India was directed towards this
end.

5.   What were the administrative difficulties
which arose out of Lord Dalhousie's annexations,
and how were they met ?

6.   At what points in the latter half of the
eighteenth century did the affairs of India enter
prominently into English politics ? Explain the
circumstances fully.

7.   Compare the extent of the power and influence of the members of the House of Lords before and after the Reform Bill of 1832.

8.   What is meant by 'Free Trade'? Explain clearly the principle upon which it is based. How far does it exist between England and India?

9.   What were the causes of the Chartist movement? To what extent have its objects been achieved?

ANCIENT HISTORY AND ALLIED GEOGRAPHY

First Paper

[Not more than six *questions to be attempted, in which question 1 must be included.]*

1   Draw a map of the Eastern half of the Mediterranean Sea. Describe—

Either, (a) The condition of the surrounding countries after the Second Punic War, and the extension of the Roman dominion in these regions until A. D. 146.

Or, (b) The growth and character of the Athenian Empire in the fifth century B. C.

2.   Account for the high reputation of Sparta in Greece, and the absence of a Spartan Empire.

3.   Examine the causes of the Peloponnesian War and relate in outline the course of the war, until the Peace of Nikias.

4.   Give an account of the conquests of Alexander the Great, and estimate their effect upon the Greek world.

5.   Contrast the structure of the Roman constitution in 450 B. C. with what existed in 250 B. C.

6.   Show the importance of Sea Power in the Punic Wars.

7.   How did the Romans administer and control the Italian peninsula, after conquering it ?

8.   Write notes on *four* of the following :—The Ephors ; The Olympic Games ; The Thirty Tyrants ; The Etruscans ; The Ager Publicus ; The Nobiles.

SECOND PAPER

[Not more than SIX questions to be answered, among which the LAST TWO must be included.]

1.   How did the foreign conquests. of Rome affect the political and social condition of Rome and Italy in the second century B. C. ?

2.   What were the grievances of the Italian allies ?   Describe the efforts made to redress them ?

3.   What is meant by the First Triumvirate ? Write an account of its actions and explain why it came to an end.

4.   The Roman Empire was a military despotism disguised under the forms of a Republic.   Discuss this statement.

5.   Give an account of the reign of *either* (*a*) Nero, *or* (*b*) Hadrian.

6.   What improvements were made in the administration of the provinces under the Principate ? How far were they maintained during the Empire ?

7.   Given an account of the relations between the Roman and the kingdom of Parthia.

8.   Write brief notes on *four* of the following :—Scipio the Younger, Gabinius, Clodius, Arminius, Decebalus, Zenobia, Alaric.

9.   Describe as clearly as you can (without drawing a map) the geographical position of the following, mentioning and any important historical events connected with them :— Pergamus, Vercellae, Brundisium, Pharsalia, Eboracum, Nicomedia, Adrianople, Châlons.

10.   Draw a sketch-map of the Roman Empire west of Greece, showing its division into provinces, and inserting six important places.

ENGLISH HISTORY—1917

First Paper

[Answer questions 1 and 2 and any FOUR *of the others.]*

1. Draw a map to illustrate the settlement of England by the Anglo-Saxons, showing the natural features which influenced its course.

2. What parts of the continent of Europe were under the dominion of the English kings before the accession of Edward III ?

3. What were the effects of the Roman occupation of Britain ?

4. What do you understand by the " Feudal System " ? How far did it prevail (i) in Europe, (ii) in England ?

5. What were the principal provisions of the Great Charter, and why were they necessary ?

6. Explain the causes of the Peasants Revolt of 1881.   Did it effect any important changes ?

7. Give some account of the rise of Spain to greatness, and explain the importance thereof in English History.

8. Describe the results of the Dissolution of the Monasteries.

9. Trace the course of the Wars of the Roses.

10. What information may be gathered from the Petition of Right as to the growth of the constitution between 1215 and 1628 ?

Or

INDIAN HISTORY

[*Answer questions 2 and 4 and any* FOUR *others.*]

1.   Compare and contrast the character, conquests and dominion of Mahmud of Ghazni and Muhammad Ghori.

2.   What circumstances led the Afghan and Moghul emperors to adopt Delhi as the capital of their Indian dominions ? What were the disadvantages of the position of Delhi as the seat of Government? Illustrate your answer by reference to the history of the period.

3.   " His whole life was spent in pursuing visionary scheme by means equally irrational ; and its results were more calamitous than those of any other Indian reign." Discuss this estimate of Muhammad bin Tughlak.

4.   How was the Deccan kingdom of the Brahmanids split up after reign of Mahmud Shah II ? Illustrate your answer by a map.

5.   Give an account of Babar's campaign against the Afghan rebels of Bihar and Bengal.

6.   Give some account of the childhood and early training of Akbar.

7.   " To govern an empire made up of such composite materials as was the Moghul empire could at no time have been an easy task." Discuss the measure adopted by Akbar to consolidate his empire.

8. Give an account of the rivalry of the sons of Shahjehan for their father's throne.

Second Paper

[*Answer questions 1 and 2 and* FOUR *others.*]

Either

1. Explain the causes and narrate the principal events of the War of the Spanish Succession, illustrating events in the Netherlands with a map.

Or

Describe Britain's share in the resistance to Napoleon I, illustrating events in the Spanish peninsula with a map.

2. Contrast the industrial condition of England in 1750 with that in 1850, showing the principal industrial areas on a map. What have been the political effects of this change ?

3. Compare the position of Charles II at his accession, with that at his death, and trace the steps by which the latter was attained.

4. What appear to you to be the most important points in the constitutional changes between 1688 and 1714 ? Why do you think each important.

5. Give an account of the use made of Sea Power, during the Seven Years' War.

6. What were the causes of the French Revolution ? Why is it regarded as a landmark in European History ?

7. Sketch the rise of Prussia to the headship of Germany.

8.   Describe the difficulties confronting Walpole as Prime Minister.   Criticise his policy and achievements.

9.   Explain what is meant by (a) She Balance of Trade, and (b) The Balance of Power, giving illustrations and comments which appear to you to be relevant.

10.   Describe the condition of the working classes at the beginning of the Nineteenth Century and the measures by which their condition has been improved.

————

Or
INDIAN HISTORY

[*Answer questions* 1 *and* FIVE *of the others.*]

1.   What circumstances in the affairs of the East India Company during the last half of the eighteenth century led to Parliamentary interference in the administration of India ?

2.   Explain the circumstances which led to the Rohilla War.

3.   Draw a map to illustrate the political condition of India in 1798.

4.   Estimate the importance to the English power in India of the rise of the Sikh power in the Punjab during the last decades of the eighteenth century.

5. Illustrate the difficulty of maintaining a policy of non-intervention from the events of Lord Hastings' Governor-Generalship.

6. Explain carefully the reasons which determined Marquess Wellesley to undertake the Second Maharatta War, and sketch the progress of the war.

7. State the principal reasons for the annexation of Oudh; and indicate how all earlier attempts to secure good government in Oudh had failed.

8. Describe the administration of the Punjab by the Sikhs, and indicate the directions in which reform was most needed after the conquest by the British.

Give some account of the growth of trade between India and England during the Nineteenth Century. Mention some of the more important factors contributing to this growth.

ANCIENT HISTORY AND ALLIED GEOGRAPHY

FIRST PAPER.

[Not more than SIX *questions to be attempted, of which one must be either* 1 *or* 10.]

1. Describe as accurately as you can the position of *five* of the following :—Amphipolis ; Megara ; Byzantium ; Leuctra; Naupactus ; Deceleia ; Olynthus. Show by reference to the facts of Greek history the importance of each. Give dates.

2.   Sketch the early history of Sparta down to the middle of the sixth century B. C.   To what causes would you attribute her success ?

3.   What causes led to the foundation of Greek colonies ? Classify the chief areas colonized, naming at least two important cities.   Draw a sketch-map of one of the areas.

4.   Describe the changes made in the Athenian constitution from the abolition of the monarchy to Pericles, pointing out the statesmen with whom they are associated.

5.   Show by reference to the facts of history the part played by Athens in the resistance to the Persians in the fifth and fourth centuries B.C.

6. . Give an account of the origin and organization of the Confederacy of Delos. How and why was it transformed ?

7.   Give an accurate narrative of the Peloponnesian War down to the Peace of Nicias, showing the part played in it by the leading men on either side.

8.   Compare the treatment of her subject allies by Athens with the treatment of her subject states by Sparta during the Spartan supremacy.

9. . Illustrate the importance of strong naval power in a Greek history.

10. Give a careful account of Alexander's invasion of Asia down to the capture of Persepolis. Illustrate your answer by a sketch-map, showing countries, chief places, and the route of Alexander.

SECOND PAPER.

[*Answer* SIX *questions, including questions* 1 *and* 9.]

1. Draw a map of the Roman Empire in A. D. 14, showing the various provinces and the dates of their incorporation.

2. Give a list with dates of the chief events in the second Punic War.

3. Explain fully the phrase ' Greece captured her captor.'

4. State clearly the reasons for the different dates of Julius Cæsar and Octavius.

5. Write a short life of *either* Cicero *or* Pompey.

6. Why do we read Roman History ?

7. State Sulla's objects in 81 B. C., how he tried to realize them, and how far he was successful.

8. Write short notes on *four* of the following : —M. Antonius, Vercingetorix, Titus Livius, P. Vergilius Maro, M. Vipsanius Agrippa, C. Marius, Pax Romana.

9. Give roughly the geographical position of the following, and any important events with which they are connected :—Thapsus, Cabira, Philippi, Bovianum Mylae, Heraclea, Veii, Mons Sacer.

ENGLISH HISTORY—1918
FIRST PAPER

[Answer Questions 1 and 2 and any FOUR *of the others.]*

1. Show by a sketch map the overseas dominions of Henry II. How were they acquired ? and how lost ?

2. Sketch briefly the struggle for supremacy among the various Anglo-Saxon kingdoms in Britain, and account for the ultimate supremacy of Wessex.

3. Give brief accounts of any three of the following :—

Domesday Survey, Thomas Becket, Wycliffe, Star Chamber, Battle of Bosworth, Saint Dunstan, Constitutions of Clarendon, Ship Money.

4. Examine the nature and extent of the relation between England and the Continent, before and immediately after the Norman Conquest.

5. Sketch the history of the English Parliament down to 1295.

6. Give an account of the Black Death. What were its most important social effects ?

7. Account for the strength of the monarchy under Elizabeth, and its weakness under James I.

8. Sketch briefly the course of the Reformation in Germany ; and contrast it with the Reformation in England.

9. Describe briefly the causes that led to the *outbreak* of the Great Rebellion.

Or,

INDIAN HISTORY, 1000 A. D.—1707 A. D.

[*Answer Questions 1 and 12 and any* FOUR *others.*]

1. Give some account of the political condition of Northern India at the time of Mahmud of Ghazni's death. Illustrate your answer with a sketch map.

2. How did Mongol raids affect the kingdom of Delhi in the thirteenth century ?

3. Do you think that the character of Muhammad bin Tughlaq has been misunderstood ?

4. Write a life of Ala-ud-din Khilji.

5. Compare the importance of the careers of Timur and Babur as influences in Indian History.

6. " Bahlol Lodi was the real founder of the greatness of Sher Shah." Discuss this.

7. Sketch the history of the Bahmanid kingdom, and show what part Mahmud Gawan played in it.

8. Why has Akbar won such a great name in Indian History ?

9. Give some account of the History of Bahadur Shah of Gujarat, indicating the part played by that monarch in the political life of his time.

10. Account for the rise of the Maratha power under Sivaji.

11. Sketch the relation between Aurangzib and the Sikhs.

12. Describe, and illustrate with a sketch map, the extension of the Mughal Empire between 1605 and 1707.

SECOND PAPER.

[*Answer Questions* 1 *and* 2 *and* FOUR *others.*]

Either,

1. Explain the cause and narrate the events of the American War of Independence, illustrating your answer with a map,

Or,

Draw a sketch map of Europe to show the chief features of the settlement of 1815.

2. Give a brief account of the expansion of the British Empire in the 19th century.

3. Discuss the points at issue between James II and Parliament, showing clearly how the King's conduct led to the Revolution of 1688.

4. Trace the growth of Cabinet Government.

7. What were the chief causes of distress and discontent in England at the beginning of the 19th century?

6. Consider the effects of the French Revolution upon English domestic and foreign politics.

7. Estimate the merits of the elder Pitt as a statesman.

8. Trace the steps in the unification of Italy.

9. Show clearly the importance to England of the control of the sea during the eighteenth century.

Or,

INDIAN HISTORY, 1707 A.D.—PRESENT DAY.

[Answer Questions 12 and any FIVE *ohers].*

1. Account for the decay of the Mughal Empire under the immediate successors of Aurangzib.

2. Why was it that the East India Company was compelled, in the eighteenth century, to become a territorial power in India ?

3. "The schemes of Dupleix, despite their grandeur, were doomed to invitable failure." Why was this ?

4. Trace the fortunes for the Maratha Confederacy from the battle of Panipat to the Second Maratha War.

5. Compare the work of Clive and Wellesley as makers of the British Dominion in India.

6. Which do you think did more for the welfare of India in his time, Warren Hastings or the Earl of Moira ?

7. Describe the career of Ranjit Singh, and account for the rapid break-up of his empire after his death.

8. "Never has Government laboured so hard to keep the peace." How was it that the outbreak of the First Sikh War could not be prevented ?

9. Estimate the value to India of the work of Henry Lawrence and of John Lawrence respectively.

10. Trace the changes in the Government of India from 1773 to 1813.

11. Compare the achievements of Lord Dalhousie and Lord Mayo.

12. Describe, with a sketch map, the growth of the Maratha power up to the battle of Panipat.

ANCIENT HISTORY AND ALLIED GEOGRAPHY.

First Paper

[*Not more than* SIX *questions to be attempted, of which one* MUST *be the* FIRST.]

1. Draw a map of Central Greece, including *only* the following countries : Corinth, Megaris, Attica, Boeotia, and the Saronic Gulf, and showing the chief places of historical importance.

2. Describe the origin and development of the archonship at Athens, and show how the archons gradually lost their importance.

3. Explain carefully *four* of the following terms : oligarchy ; tyranny ; autonomy ; ephor ; cleruchy ; liturgy.

4. Write in outline a clear account of the rise and progress of the Persian power down to 500 B.C.

5. What changes were made by Cleisthenes in the system of tribes at Athens ? Why did he make them, and how did he make them a basis for further constitutional changes ?

6.   Give an account of the affairs in Greece between the battle of Salamis and the battle of Plataea, and explain the importance of the last-named battle.

7.   Describe as exactly as you can the geographical situation of *four* of the following places, and state why they are noteworthy : Tegea, Chossus, Thurli, Cunaxa, Mycenae.

8.   Give an historical account of Athens in relation to other Greek independent states under Pericles down to the Thirty Years' Peace.

9.   Describe and account for the revival of Athenian power in the fourth century B.C.

10.   Give an account of the Theban supremacy and explain the rapidity of its rise and fall.

11.   From what different sources is our knowledge of this period of Greek history derived? Give instances of knowledge obtained from each of the sources named.

SECOND PAPER

[*Answer* SIX *questions, including Questions 3 and 9.*]

1.   Narrate in detail the Asiatic campaign of Alexander from his departure from Egypt to the death of Darius.

2.   What were the most important kingdoms that arose out of the division of Alexander's empire? Give a brief account of their subsequent history.

3. Trace the influence which the geographical configuration of the Italian peninsula exercised upon Roman history.

4. Summarise the most important political and social results of the Punic wars.

5. What were the grievances which Tiberius Gracchus proposed to alleviate, and how far was he successful?

6. What were the causes of the Social war, and by what concessions was it brought to a close?

7. Describe the career of Pompey.

8. Write an account of Caesar's Conquest of Gaul and explain his difficulties.

9. Describe the methods of provincial administration introduced by Augustus, and show in what respects they were an improvement on the methods employed under the Republic.

ENGLISH AND EUROPEAN HISTORY—1919

FIRST PAPER.

[Answer questions 1, 2 and 3, and any THREE of the others.]

1.   Trace briefly the struggle which led to the supremacy of Wessex over the other Anglo-Saxon kingdoms of Britain. Explain the reasons for this supremacy, and illustrate your answer by a sketch-map.

2.   Draw a map of Europe to show the rise of great national states at the beginning of the 16th century.

3.   Edward III has been called " The father of English commerce and manufacture." Justify this, and illustrate your answer by reference to any statutes or documents you have come across.

Or,

Trace carefully the course of events which resulted in the passing of the Poor Law of 1601, and show how this law was superior to previous laws of which you have read extracts.

4.   Why is the reign of Henry II important in English History ?

5.   What were the differences between de Montfort's Parliament and the Parliament of 1295 ?

6.   What difficulties had Henry IV to contend with, and how did he overcome them ?

7.   Show clearly why the Tudor despotism was successful and the Stuart despotism a failure. Give instances to illustrate your answer.

8. Give a short account of the struggle between the Popes and the Emperors during the eleventh century, illustrating from any documents you have read, the points at issue.

9. What do you know of Feudalism as existed in England, and in Europe generally?

10. Give a short account of the growth of European towns during the Middle Ages, illustrating your answer by reference to any contemporary documents you know.

11. Give some account of the Renaissance, showing clearly its general and immediate causes, and the difference in its development in such countries as Italy and Germany.

Or,

INDIAN HISTORY.

[Answer Questions 3 and 7 and any FOUR others.]

1. Who were the Seljuk Turks, and how did their movements in Central Asia affect the destinies of India?

2. Give a brief account of the rise and fall of the Ghaznavid power, with dates.

3. Draw a map to illustrate the empire of Mahmud of Ghazni at its greatest extent.

4. "Such results testify to the greatness of a remarkable king." In what ways was Ala-ud-din Khalji a great and remarkable ruler?

5. How do you account for the disintegration of the Delhi empire after the death of Firoz Tughlak?

6. "Firoz Tughlak brought taxation back to the limits prescribed by the law of the Koran." What were the taxes prescribed by the law of the Koran?

7. Draw a map to illustrate the extent of the kingdom of the Sharki Maliks of Jaunpur in the early fifteenth century.

8. Describe the disposition of Babar's army at the battle of Panipat.

9. Describe the Mansabdari system of the Moghul Emperors. How was it abused?

10. Estimate the historical value of the records of European travellers who visited the Moghul Court in the sixteenth and seventeenth centuries.

11. "The Deccan was the Dauphiné of the Moghul Empire." Explain what is meant by this.

12. Account for the failure of Aurangzib's plans for suppressing the Maratha rebels.

SECOND PAPER

[Answer Questions 1 and 2 and FOUR others.]
Either,

1. Give an account of Napoleon's campaigns against Austria and Italy, illustrating your account with a map.

Or,

Draw a map of the Balkan countries, and explain what territorial re-arrangements took place after the Berlin Congress of 1878.

2. Give concise account of the growth of English commercial enterprise in the 18th century, with special reference to the struggle for Sea power.

3. "The eighteenth century merely worked out in detail the Parliamentary victory won by the revolution of 1688."

Explain this statement, with special reference to the growth of the power of the Cabinet.

4. Give an account of the Seven Years' War and explain why at this time the interests of France and of Britain were inevitably opposed.

5. "In constitutional matters Cromwell was a completer tyrant than ever Charles had been."

Explain and illustrate with reference to the period of the Puritan Revolution.

6. Account for the decline of English influence in Europe during the reign of Chares II.

7. Give an account of the origin of the National Debt and explain its connection with the Bank of England.

8. What is meant by the phrase "Balance of Power." When did the principle first attain a practical importance in Europe ?

9. Explain what is meant by (a) "Napoleon's continental system," (b) "the re-making of Europe after 1815," (c) "principle of nationalism."

Or,

INDIAN HISTORY, 1707 TO PRESENT DAY.

[Answer Questions 1 and 2 and any FOUR others.]

1.   Describe the territorial extension of the Maratha power from 1707 to 1761, and illustrate your answer by a map.

2.   Draw a map to illustrate the growth of the British Dominion in India from 1798 to 1823. Write *brief* explanatory notes.

3.   Give an account of the causes and results of the wars between the English and the Mahomedan Kingdom of Mysore.

4.   Describe the chief reforms introduced by Warren Hastings and point out their importance.

5.   How do you account for the failure of the French to found an Empire in India ?

6.   With what objects did Lord Auckland intervene in the affairs of Afghanistan ? Did he attain those objects ?

7.   Trace the principal steps by which the English Parliament secured control over the East India Company.

8.   Give some account of the condition of Oudh in the time of Dalhousie, and explain the causes that led him to annex it.

9.   Give a brief sketch of the history of one of the Maratha states since the time of the Marquess of Hastings.

10.   Why did the Mutiny occur ? Describe the most important results of it.

ANCIENT HISTORY AND ALLIED GEOGRAPHY

FIRST PAPER

Six questions only to be attempted, which must include Question 1 and at least one other from Section A.

A

1. Describe the struggle for supremacy in Greece from 400 to 362 B. C., illustrating your answer with a map.

2. Give an account of the organisation of the Athenian Empire and of the grievances of the Allies.

3. What were the chief foundations of democracy at Athens under Pericles ? To what extent was he their creator ?

B

4. Compare the parts played by Athens and by Sparta in the Greek resistance to Persia.

5. State the sources of strength of Sparta and account for the absence of a Spartan Empire.

6. Describe the relations of Sparta and Athens between the Persian and the Peloponnesian Wars.

7. Insert in a sketch-map the chief Greek colonies in Sicily and Italy, and give an account of their resistance to Carthage during the Persian Wars.

8. Estimate the importance of any two of the following in ancient Greece:—(a) The Olympic Games (b) The Delphic Oracle ; (c) The Dionysian Festivals ; (d) The Homeric Poems.

9.   What are the chief differences between modern democracy and democracy in ancient Greece ?

SECOND PAPER

[Answer SIX questions, including questions 2 and 5]

1.   Give an account of the Second Punic War, and state what you consider were the reasons for the victory of the Romans.

2.   "The result of Alexander's conquests may be summed up in the phrase ' the expansion of Greece.' " Explain and illustrate this statement.

3.   Describe the means by which the Romans established their supremacy in Italy.

4.   Describe the career of Marius and estimate its significance.

5.   What do you know of the history of the Roman Senate ?

6.   Upon what foundations was the power of Augustus built ?

7.   What was the condition of Roman literature and Roman religion during the reign of Augustus ?

8.   What do know of the Macedonian Wars, and what were their results for Greece ?

9.   Draw a map of Italy, showing the mountain ranges, the courses of the chief rivers, and the sites of four battles fought in the days of the Roman Republic.

MODERN ENGLISH AND EUROPEAN HISTORY—1920

First Paper

Six *questions only should be attempted, two from each part. One of the map questions, marked with an asterisk, is compulsory.*

A

1. Estimate the importance of the reign of Canute in English History.

2. Give an account of William II's struggle with the Church.

3. It has been said that next to Alfred, Edward I is the greatest of English kings. Do you agree with this ? Give reasons for your answer.

*4. Draw a map to illustrate the Wars of the Roses. In what way do they mark a turning-point in English History ?

B

5. What did Henry VII do for England, and how did he do it ?

6. Describe the development of England's sea power and commerce during the sixteenth century.

7. Give a brief account of the work of Thomas Cromwell.

8. Give the main outlines of the struggle between King and Parliament from 1603 to 1648.

C

9. Estimate the influence of the Monastic Orders of the Middle Ages.

10.   Give a brief account of the work of Riche-
lieu.

11.   Account for the advance of the Ottoman
Empire in Europe from 1453 to 1512.

*12.   Draw a map of Europe in 1519.

Or,

INDIAN HISTORY, 1000 A. D.—1701 A. D.

[*Answer Questions 1 and 2 and any four others.*]

1.   Briefly describe, with the aid of a sketch-
map, the political situation in India at the death of
Mahommed bin Tughlak.

2.   Describe, with a sketch-map, the expansion
of the Mughal Empire during the reign of Aurang-
zeb.

3.   Did the raids of Mahmud of Ghazni exert
any permanent influence upon the politics of North-
ern India ?

4.   Who was the greatest of the Slave Kings ?

5.   Compare the character and achievements
of Ala-ud-din Khilji and Mahommed bin Tughlak.

6.   Briefly describe the history of Jaunpur
under the Sharqi Kings.

7.   Was the fifteenth century a period of
" unrelieved gloom " in Indian history ?

8.   How far does the year 1526 mark the
beginning of a new era ?

9.   Give some account of the poets, philosophers
and historians patronised by Akbar.

10. How far was the rise of the Marathas due to a religious revival ?

11. What truth is there in the theory that " Aurangzeb laboured his life through to undo the mistakes of Akbar " ?

12. Describe the activities of European settlers in India between 1600 and 1700.

ENGLISH HISTORY

SECOND PAPER

Answer Questions 1 and 2 and four *others.*
Either,

1. Give a concise account of the campaigns in the Peninsular War of 1808—1813, illustrating your answer by means of a map.

Or,

Show by means of a map the importance of the territorial settlement of the Treaty of Utrecht in 1713.

2. What is meant by the " Industrial Revolution." Explain how Britain was able to recover so rapidly from the effects of the Napoleonic Wars.

3. Give an account of the events that led to the restoration of Charles II.

4. Explain why the policy of Louis XIV was menace to Europe, and show how it ultimately involved England in a war with France.

31

5. Write short notes on any *three* of the following :—

"Suspending and Dispensing Powers," "Ballot Act," "Convention Parliament," "Navigation Act," "Act of Settlement."

6. "The chief strength of Parliament during Eighteenth Century lay in its control of taxation." Explain and illustrate this statement with special reference to the period of the Georges.

7. Explain fully what is meant by any *two* of the following :—"Imperial Federation." "The Budget," "Free Trade and Protection," "The Privy Council," "League of Nations."

8. Show clearly the importance of the British Naval victories in the Napoleonic struggle.

9. What were the points at issue in the Crimean War ? Give the main features of the Treaty of Paris of 1856.

Or,

INDIAN HISTORY

Answer Questions 1 and 7 and any four others.

1. Illustrate by a map, and give a brief explanation of, the distribution of power in India at the close of Lord Wellesley's administration.

2. What were the results to victors and vanquished of the Battle of Panipat ? How did it

affect the position of the British in India ?   Illustrate by reference to the Battle of Buxar.

3.   What has been the general policy of British rulers in India towards the Government of Afghanistan ?   Exemplify by stating the causes of, and the settlements after, the 1st, 2nd and 3rd Afghan wars.

4.   Explain and illustrate the part which sea-power has played in the building up of the British Empire in India.

5.   Describe the condition of affairs in the Panjab after the first Sikh war.   Explain why these conditions made the second war almost inevitable.

6.   What do you understand by the Moral and Material progress of India ?   In what direction has this progress been most marked in the present century ?

7.   What was the attitude of (1) Warren Hastings, (2) Lord Wellesley, towards Oudh ? What consequences followed in each case ? Illustrate by a map.

8.   Compare the Madras Land Revenue Settlement with the Permanent Settlement in Bengal, and account for the difference.

9.   Describe the reforms introduced by Lord William Bentinck, and estimate their importance.

10.   Explain fully the circumstances that led to the making of the Treaty of Bassein.   Estimate its importance, and describe the struggle to which it gave rise.

ANCIENT HISTORY

Six *questions only to be attempted, which must in-*
clude Question 1 *and at least one other of Section A.*

A

1. Draw a map of *either* Central Greece from
the northern border of Thessaly to the Gulf of
Corinth *or* the Peloponnesus, and explain how the
geographical conditions shown have affected the
history of the region.

2. "The changes was one of great significance
in the constitutional history of Athens." Show the
constitutional significance of the attack on the
Areopagus under Ephialtes and Pericles.

3. "He plunged her into a hopeless and de-
moralising war." Discuss the personal responsibility
of Pericles for the Peloponnesian war.

B

4. Describe (*a*) the reasons for Greek colonisa-
tion ; (*b*) the nature of a Greek colony ; and (*c*) the
colonies of either Miletus or Chelcis.

5. What were the changes introduced at Athens
by Cleisthenes and why where the necessary ?

6. Explain the growth and nature of "Tyr-
anny" amoung the Greeks.

7. Give an account of the Peloponnesian War
subsequent to the Sicilian expedition.

8. Describe Persian action with regard to
Greece from 404—386 B. C.

9. Trace the steps by which Philip attained to
the headship of Greece.

MODERN ENGLISH AND EUROPEAN HISTORY.—1921.

FIRST PAPER.

Six questions only should be attempted, not more· than two from each section. One of the map questions marked with an asterisk is compulsory.

A.

*1. (a) Draw a map showing the extent of the Roman occupation of Britain, the chief Roman roads and the chief Roman towns.

(b) Describe briefly the state of Britain immediately after the departure of the Roman legions.

2. How do you explain the immediate success of the Norman invaders as compared with the protracted struggle which the Anglo-Saxon invaders had to make for the conquest of Britain ?

3. Explain fully the importance of the Battle of Bouvines in European history and English history respectively.

4. Examine the social effects which resulted from the Black Death.

B.

5. Estimate the social and political effects of Henry VIII's rule.

6. What causes contributed to make the 16th century remarkable for maritime enterprise. Name some of the earliest discoveries.

7. Give examples to prove the growth of the power of the Commons during the reigns of Elizabeth, James I and Charles I.

8. What were the relations (a) between England and Ireland, (b) between England and Scotland during the reign of Elizabeth?

C.

9. State the causes and results of the Thirty Years' War. What was the attitude of the King (James I) and of the people of England towards it? What part did England play in this war?

10. What do you know of Joan of Arc? Describe the campaign in which she figured; and detail the events which followed her death.

11. Write short notes on five of the following :—Arnold of Winkelried, "God's troubadour," Canossa, the "Hansa," Bertrand du Guesclin, "Utopia," Danegeld Offa's Dyke. Water Beggars.

*12. Draw a map showing the distribution of power in Europe in 1588.

Or,
INDIAN HISTORY.

Answer two questions from each section A, B and C.

A.

1. Describe the career in India of Muhammad Ghori and show the extent of his conquests on a sketch map.

2. Draw a map to illustrate the extent, and the wars, of the Empire of Vijayanagar. How do you account for the downfall of that Empire?

3. Draw a map of Akbar's Empire showing the provinces, and give an account of his system of administration.

B.

4. What are some of the chief *contemporary* sources for the history of Mediæval India? Mention important facts connected with any two of them.

5. Contrast the careers, and policies of Balban and Ala-ud-din.

6. Give your estimate of the policy and government of Firoz Shah III.

7. *Write a brief general account of the state of* India at the time of Baber's invasion.

C.

8. Sketch the career of Humayun and give an estimate of his character and ability.

9. Mention some of the chief buildings erected during the reign of Shahjehan, and give a description of one of them.

10. What part did Sivaje play in the rise of the Maratha Power?

11. Give a careful account of the East India Company up to 1700.

ANCIENT HISTORY AND ALLIED GEOGRAPHY.

FIRST PAPER

SIX questions only to be attempted, which must include Question 1 and at least one other from section A.

A

1. Describe the growth of the Athenian power on the mainland of Greece up to the Thirty Years' Peace.

Illustrate your answer with a map.

2. " For good or for evil, the Heliaea is his contribution to the public institutions of Athens." What elements of good or of evil were there in the Heliaea at Athens in the time of Pericles?

3. The concessions made by the Athenians in 445 B.C. were much greater than those they refused to make in 431.

Give reasons for this.

B.

4. Give a detailed account of the battle of Plataea, illustrating your answer with a sketch-map.

5. Describe the early growth of Spartan power, and the organisation of the Spartan state.

6. Give an account of the Greek resistance to Carthage, in the days of Dionysius, the Elder.

7. Write notes on any two of the following :—

(a) Greek Democracy ;

(b) the Attic Tragedy ;

(c) the Athenian Acropolis ;

(d) the Agora at Athens.

8. Sketch the course of the Peloponnesian War up to the Peace of Nicias.

9. Describe the history of Thessaly during the first half of the 4th Century B C. and show how it affected the rest of Greece.

ANCIENT HISTORY AND ALLIED GEOGRAPHY.

SECOND PAPER

Answer any FIVE questions Each question carries TEN marks.

1. Write a brief account of the Roman Monarchy, distinguishing, as far as you can, genuine history from mere legend. Give a map of the Rome of the Period.

2. Compare the achievements of Philip of Macedon and his son, Alexander the Great. Mark on a sketch-map the position of any places (within the Balkan Peninsula) that you mention.

3. Trace the steps in the struggle of the Plebeians for political equality.

4. Sketch the career of Pyrrhus of Epirus. Illustrate his campaigns by a map.

5. Give some account of the civilisation of Carthage. Give a map of Carthage and her possession at their greatest extent.

6. Why did Hannibal fail to conquer Rome ? Show on a map the position of any places (within Italy) that you mention.

7. Sketch the relations of Rome with *either* (1) Macedonia, B. C. 215—146 *or* 2 Pontus B. C. 133—63. Illustrate your answer with a map.

8. Give your estimate of *either* (1) Sulla *or* (2) Cicero.

9. Describe the administrative system of the Empire under Augustus. Give a map to show the territorial divisions.

10. Trace the development of *either* (1) Natural Science and Philosophy, *or* (2) Jurisprudence, *or* (3) Military and Naval Science, *or* (4) Literature, within your period (B. C. 362—A. D. 14).

11. Examine the influence of agrarian consideration on Roman politics.

ENGLISH HISTORY.
SECOND PAPER

Answer questions 1 and 2 and FOUR others.
Either,

1. (*a*) Give an account of Napoleon's invasion of Russia and his campaign against Prussia.

Illustrate your account by means of a map.

Or,

(b) Illustrate by means of a map the territorial changes that followed the Congress of Vienna in 1815. Indicate briefly the chief points in which the arrangements then made differ from the conditions established by the Treaty of Utrecht.

2. (a) Give a general account of English colonisation in the 17th and 18th centuries.

Or.

(b) Describe the social and the economic changes that marked the Industrial Revolution.

3. Discuss and explain the attitude of England towards the French Revolution.

4. Write short notes on any *three* of the following :—

"Representative Government," "Co-operative System," "Imperial Devolution," "Preferential Tariff," "League of Nations Tribunal," "National Debt."

5. Criticise the part played by Frederick the Great of Prussia in the war of the Austrian Succession. What were his objects and what did he achieve ?

6. "The Parliaments of the Restoration were more violently Royalish than the Crown itself.

Explain the meaning of this statement, and illustrate from the Acts passed in Charles II's reign.

7.   Give an account with dates of any *three* of the following :—" Declaration of Right," " Berlin Decrees," " Habeas Corpus Act," " Darien Scheme," " Cabal Ministry," " South Sea Bubble."

8.   Give some account of the origin of the party System and Cabinet Government, and show their connection with the control of taxation.

9.   Describe briefly the stages in the unification of Italy, referring particularly to the parts played by Cavour and Garibaldi.

Or,

INDIAN HISTORY.

Answer question 1 and FIVE others.

Draw a map to illustrate the political condition of India in 1748.   Write brief explanatory notes.

2. ♥ Describe the Maratha system of government during the first half of the eighteen century, and show how it conduced to the rapid extension of their power.

3.   Write a brief account of 'The Seven Years' War' in India.   Explain—

(1) why it marks a turning point in the Anglo-French struggle ;

(2) the importance of its naval operations.

Describe the reforms introduced by Warren Hastings and explain their importance by reference to the abuses which they removed.

5. Describe the career and policy of Ranjit Singh; refer to his relations with the British Government.

6. How was the British dominion in India menaced in the time of the first Lord Minto ? What steps did he take to preserve it, and with what result ?

7. Explain the circumstances under which the policy of non-intervention was introduced, and the causes to which its abandonment was due.

8. Describe the train of events that came to an end with the annexation of the Punjab.

9. What are the most important differences between the Government of India now and one hundred years ago. Trace the steps by which these changes have been brought about.

C

9. What part did Prussia take in the unification of Germany during the nineteenth century ?

10. What do you consider the chief political, social, commercial and industrial differences between the 18th and 19th centuries ?

11. Give a brief account of the development of British colonial policy during the nineteenth century, illustrating your answer with reference either to South Africa, Australia or Canada.

12. What were the chief objects with which the various countries took part in the world war of 1914 ?

SECOND PAPER—(a).

Either (A).
ENGLISH HISTORY.

Answer six questions in all, FOUR from section A and TWO from Section B.

A

1. What measures did William the Conqueror take to secure his position in England ?

2. In what sense was the Great Charter of 1215 a landmark in English History ? What new principles did it embody, and what was their importance ?

3. Give a short account of the origin of the English Parliament, and show how the National Council grew into the modern Parliament.

4. What were the chief social and political results of the Wars of the Roses?

5. Describe briefly the causes of the quarrel between Charles I and his Parliament.

6. "Cromwell was frankly a military despot governing for the nation's good."

Explain fully the meaning of this statemnt.

7. What were the effects on the English constitution of the Revolution of 1688 ? Refer particularly to the development of the Cabinet system.

8. Tell what you know of any *two* of the following :—

The Privy Council, Star Chamber Court, Monopolies, Popular Government, Imperial Preference.

B

1. Give a short account of the industrial and social changes in England in the 19th century.

2. Explain the meaning of the following terms:—

Indirect Taxation, Poor-Law Relief, Free Trade.

3. What were the economic causes of the Peasants' Revolt in 1381 ? Refer particularly to the effects of the Black Death and the Statute of Labourers.

4. Give a detailed account of any *two* of the following :—

The Manorial System, Repeal of the Corn Laws, Colonisation of America, Abolition of Slavery.

Or (B).

INDIAN HISTORY FROM 1500.

Answer question 1 and FIVE others.

1. Draw a map to illustrate the political condition of India in 1526.   Write brief explanatory notes.

2. Give a short account of the administration of Sher Shah.

3. Briefly sketch the religious policy of Akbar. Give a clear idea of his Din Ilahi.

4. "Aurangzeb's life had been a vast failure, but he had failed grandly."

Explain this statement.

5. Describe Sivaji's Civil and Military Administration.

6. Trace the growth of Maratha power from 1707 to 1761.

7. Briefly sketch the career of Mahadaji Sindia, and discuss his policy.

8. Describe the rise of the French power in India up to the departure of Dupleix.

9. Discuss the policy of Warren Hastings with regard to the Nawabs of Oudh.

10. Describe the administrative reforms introduced by Lord Cornwallis.

11. "The administration of Lord Dalhousie may be summed up in the three words—acquisition, consolidation, development."

Explain this statement.

12. Trace the changes in the government of India from 1858 to 1909.

8.   Write notes on any two of the following : —

(a) Cleruchies, (b) The Amphictyonic Council, (c) The Olympic Games, (d) The Ephors.

ANCIENT HISTORY.

SECOND PAPER.

Answer any FIVE *questions. Each question carries* 10 *marks.*

1.   Sketch the relations between Rome and the Gauls in the 4th and 3rd centuries B.C. Illustrate your answer with a map.

2.   Trace clearly the steps in the Roman conquest of the Samnites, with a map to show the places you mention.

3.   Give some account of the Roman conquest and Government of Sicily. Make a map of Sicily in the Roman Period.

4.   Describe in detail, with a sketch-map, any *one* of the following campaigns—Pharsalus, Philippi, Actium.

5.   Compare Demosthenes and Cicero as orators and politicians.

6.   What is your estimate of Julius Cæsar as a statesman?

7.   Write short biographical notes on Cleopatra, Sextus Pompeius, Agrippa, Maecenas, Lepidus.

8.   Give some account of Latin literature in the time of Augustus.

9. Augustus says of himself—"In my sixth
and seventh consulships [B.C. 28, 27]....having by
universal consent become possessed of the sole direc-
tion of affairs, I transferred the republic from my
power to the will of the senate and people of Rome
...After that time I took precedence of all in rank,
but of power I had nothing more than those who
were my colleagues in the several magistracies."
Comment on this passage.

———

HISTORY—MODERN (EUROPEAN).—1923

FIRST PAPER

Time—Three hours.

(Five *questions to be attempted, one at least from each
part. A, B, C and D.)*

All questions carry equal marks.

A.

1.   What were the influences which led to the
change from Mediæval to Modern Europe ?

2.   Draw a sketch map of Europe in 1492,
showing the various kingdoms then existing, and
explain briefly the situation in France, Spain and
Italy.

3.   What part did England take in the voyages
and discoveries of the 16th century and   what
influence did they have on her development ?

B.

4.   What was the policy of Louis XIV—

(*a*) Internally as regards France.

(*b*) Externally in his relations with other coun-
tries ?   How far did his policy succeed ?

5.   Describe the struggle between France and
England on the Continent of America during the
Seven Years' War, illustrating your answer by a map.

6.   Trace briefly the course of the French Revo-
lution and show its influence on Europe generally.

C.

7. What was the Industrial Revolution in England? What were its results?

8. Give a short account of the Franco-Prussian War, its causes and effects.

9. What do you know about the Union of South Africa? What are its component parts and how did each come into British hands?

D.

10. Give a brief account of the British connection with Egypt and the Soudan up to the outbreak of the Great War.

11. What is meant by a mandate? Over what countries is Great Britain the mandatory power?

12. Explain carefully what is meant by a Self-Governing Dominion. What are its relations with the mother country?

MODERN HISTORY, II (a) ENGLISH HISTORY.

SECOND PAPER.

Time—Three hours.

Only six questions should be answered. four from section A, and two from section B.

Section A.

1. Describe the social and economic condition of England as revealed by the Domesday Book.

2. Describe the condition of England at the accession of Henry II to the throne. What measures did he adopt to restore order?

3.　Give a brief account of the wars of England with Scotland under the first three Edwards.

4.　What measures did Henry VIII adopt to sever the connection between England and the Papacy?

5.　Describe England's relations with France and Holland during the reign of Charles II.

6.　Discuss the causes of the War of American Independence.

7.　Mention the chief abuses in the Parliamentary system at the beginning of the nineteenth century, and show how far they were removed by the First Reform Bill.

8.　Write short notes on any *four* of the following :—

The Provisions of Oxford : The Pilgrim Fathers ; The Age of Discovery or Exploration ; The Petition of Right ; A Declaration of Indulgence ; The Habeas Corpus Act.

Section B.

1.　Give some account of the Black Death, with special reference to its economic and social effects.

2.　Give a brief account of the Industrial Revolution.

3.　Narrate the story of British colonisation in the seventeenth century.

4.　Give a short account of any *two* of the following :—

The Guild ; the Poor Law ; the Suppression of Monasteries ; the Factory system.

Or.

History, Indian.

Answer six questions.   Question 12 is compulsory.

1.   Give a short account of Humayun's struggle under Sher Shah.   Draw a map of North India, and mark in it the route followed by Humayun in his flight.

2.   What was the political condition of India under Shah Jehan?

3.   Describe the career, and discuss the policy, of the Sayyad brothers.

4.   Draw a map of India, and mark in it the territories acquired by the Mahratas, up till 1748. How were they acquired, and when?

5.   Compare Dupleix's policy in the Deccan, with Clive's policy in Bengal.

6.   Describe the judicial and revenue reforms of Warren Hastings.

7.   Draw a map of Southern India, and mark in it the territories acquired by Lords Cornwallis and Wellesley.   Write down the dates on which these territories were acquired.

8.   Trace the causes, and sum up the results of the First Afghan War.

9.   Discuss Lord Dalhousie's doctrine of "lapse," and show how it was applied.

10.   Give a short account of Lord Lytton's viceroyalty.

11. Compare the reforms of 1909 with those of 1919.

12. Write notes on any *three* of the following :—

(a) Mahabat Khan.

(b) Jehandar Shah.

(c) Burhanul Mulk.

(d) Mir Kasim.

(e) The Ahamadiya movement.

ANCIENT HISTORY.

FIRST PAPER.

Time—Three hours.

Answer any five *questions.*

1. " It is in the Aegean and its possessors that we see the development of [Greek] History." Examine this statement. Draw a map of the Aegean Sea.

2. Give some account of the Minoan civilisation of Crete. Draw a map of Crete.

3. Explain what is meant by the Age of Colonisation. Draw a map to show where Greek colonies were founded.

4. Account for the rise of tyranny in Greek States. Write short biographical notes on any *five* tyrants.

5. Sketch briefly the Constitutional history of Athens down to the Constitution of Cleisthenes.

6.   What is your estimate of Themistocles?

7.   Examine the importance of Sea-power in the Peloponnesian War.

8.   Imagine you are a Spartan on a visit to Athens in the time of Pericles. Give an account of a day's experience in the city.

9.   What chances were there of uniting Greece between the end of the Peloponnesian War and the death of Epaminondas?

ANCIENT HISTORY.

SECOND PAPER

Time—Three hours.

Answer Question 10 and any four others.

1.   Describe the religion of the early Romans. Account for its decay by the time of the Empire and state the steps which Augustus took to revive it.

2.   Write short notes on the Latin League, Municipia, Spartacus, Catiline, the Twelve Tables.

3.   What were the political and economic results in Italy of the Punic Wars?

4.   What abuses was the legislation of Tiberius Gracchus intended to redress? Give a short account of the reform movement between 133—121 B.C.

5.   Write an account of the war with Jugurtha. Illustrate your answer with a map.

6.   Describe either (a) Sulla's reforms and their subsequent fate or (b) Cæsar's reforms 48—44 B.C.

7.   Describe shortly Cæsar's campaigns in Gaul. Illustrate your answer with a map.

8.   What was the position of (a) the popular assemblies, (b) the magistracies, (c) the Senate, in the time of Augustus ?

9.   What is your estimate of (a) the character, (b) the statesmanship, (c) the strategical insight of Alexander the Great ?

10.   Draw a map of Italy, putting in (a) the routes by which a Roman in the time of the Empire would travel from Rome (1) to Brundisium, (2) to Ariminum (b) the districts and the chief towns through which he would pass in each case.

Intermediate Examination Papers, 1909

LOGIC

1. What in your opinion are the uses of the study of Logic ?

2. What purpose is served by the process of logical division ? Examine by the rules of logical division the correctness of the following :—

    (a) Men into those that lend and those that borrow.

    (b) Nations into progressive and Indo-Aryan.

    (c) World into Europe, Asia, Africa, America and Australia.

3. What terms cannot be defined, and why ?

Examine the following definitions :—

    (a) Logic is the science of thought.

    (b) Man is a featherless biped.

    (c) A plant is a being possessing vegetable life.

    (d) God is a precious metal.

4. Give the quantity and quality of the following propositions, and convert them :—

    (a) Only Parisians speak French perfectly.

    (b) Few of the passengers escaped.

    (c) None but Englishmen fought in that battle.

(d) Not a few women have been great
writers.

5. What is an inference ? How have in-
ferences been classified ? Supply examples of the
various kinds you distinguish.

6. (a) What is the *figure* of a syllogism, and
what is the mood ? How is each
related to the other ?

(b) Prove that an *A* conclusion is valid in
one syllogistic figure.

7. Discuss the question whether in Logic we
ought to regard the alternatives in a disjunctive
judgment as mutually exclusive or not. Show how
the analysis of the disjunctive syllogism depends on
the answer given to this question.

8. . Examine the validity of the following ar-
guments, stating clearly in your own words in
what respects they seem to you unsatisfactory :—

(a) It is *evident* that Solon was *peculiarly*
qualified for being a ruler ; because he
was remarkable for his wisdom and we
know that it is the wise only who are
fitted to rule.

(b) The trees in the park make a thick shade ;
this is one of them, therefore this tree
makes a thick shade.

(c) My opinions must be true, for none but a
prejudiced person, like yourself, would
wish to gainsay them.

LOGIC—1910

[*Question 6 should be attempted, and not more than* FIVE *others.*]

1.   Describe the logical characters of the following terms :—Ten, King Alexander, the majority, manhood, merciless.

Define and illustrate—species, accident verbal proposition, categories.

2.   What errors must we avoid in giving definitions ? Define the term ' undergraduate '; and show how your answer fulfils the conditions of a good definition.

3.   Draw as many inferences as you can from the following propositions, giving in each case the logical name of the kind of inference : —

(*a*) All poets have known great sorrow.

(*b*) Some professional men are dishonest.

(*c*) If the powder becomes wet, the gun is rendered useless.

5.   Prove the ' following Rules of the Syllogism :—

(*a*) The Middle Term must be distributed at least once in the Premisses.

(*b*) No term must be distributed in the conclusion unless it is distributed in one of the Premisses.

Give examples of fallacies due to the neglect of these Rules.

5. Construct Syllogisms in Camestres, Felapton, and Fresison ; and reduce them to the corresponding mood of the First Figure.

6. Arrange the following arguments in logical form, and criticize them :—

(a) Not abstinence, but moderation, is the true morality ; therefore the man who commits a theft occasionally is a more moral man than he who is always honest.

(b) Philosophy is a useless study. Who ever become a penny the richer by studying philosophy ?

(c) Only industrious students pass their examination. But Ramchandra has failed in his examination. Therefore Ramchandra is not an industrious student.

(d) A public speaker need never be afraid to address an audience however large. For the audience is composed of individuals ; and he would not be afraid to speak privately to any one of these individuals.

7. ' All good men are happy.
Mr. Smith is a good man.
Therefore Mr. Smith is happy.'

' If we know beforehand that Mr. Smith is happy, there is no need of an argument to prove it. If we do not know beforehand that Mr. Smith is happy, then we are not entitled to say that " all good men

are happy." Therefore either the syllogism is useless, or it is a " petitio principaii." '

Criticize this statement.

8.   *Either*

(a) ' An Epicheirema is an abbreviated chain of reasoning, consisting of an Episyllogism with one or two enthymematic Prosyllogisms.'

Fully explain this statement and illustrate by a concrete example.

                    Or

(b) ' What is the First Principal or Axiom underlying the reasoning in the Syllogism ? Discuss the question whether this Axiom is a necessary truth.'

DEDUCTIVE LOGIC—1911

[Six *questions to be attempted, of which question* 8 *must be one*]

1. State and criticize any *three* definitions of logic with which you may be familiar. What definition do you yourself prefer, and on what grounds?

2. Define and illustrate—universal, relative term, categories, differentia, opposition, syllogism.

3. Explain clearly what is meant by the extension and intension of terms, and discuss and criticize the following doctrines :—

(*a*) Extension and intension of terms vary inversely.

(*b*) Proper names have no connotation or intension.

4. What do you understand by Heads of Predicables?

Compare Aristotle's and Porphyry's classifications of predicables, explaining the different points of view from which they arrived at their classifications. Which classifications do you consider superior, and on what grounds?

5. Draw as many inferences as you can from the following propositions, giving in each case the logical name of the kind of inference :—

(*a*) Some men of great imaginative power are no poetical.

(*b*) If a man is honest he is trusted.

33

6. What do you understand by Reduction, and what value do you attach to it? Construct a syllogism in Baroco and establish it both by Indirect Reduction and by Reduction by Negation.

7. What do you understand by fallacy? Should logic include discussion of fallacies, and if so, why?

Explain clearly what is meant by (a) fallacy of division, (b) fallacy of accident, and give an example of each.

8. Arrange the following arguments in logical form and criticize them :—

(a) If education is popular, compulsion is unnecessary if unpopular, compulsion will not be tolerated.

(b) In a lottery it is improbable that any particular person will draw the prize. But some one must draw the prize. Therefore something improbable is bound to happen.

(c) I cannot accept your doctrine as true, for it seems to me that its general acceptance would be attended with the most injurious consequences to society.

DEDUCTIVE LOGIC—1912

[SIX *questions to be attempted, of which question* 8 *must be one.*]

1. Define and illustrate—subject, predicate, relative term, absolute term, genus, species extension, intension, property, accident.

2. Give, with a brief explanation the main rules of definition.   Mention any classes of terms known to you that cannot be defined, explaining in each case why definition is impossible.

3. What do you understand by physical division logical division, *fundamentum divisionis*, cross-division ?

Explain clearly what is meant by division by dichotomy and estimate the value of the method.

4. Explain fully what is meant by the Categories. Give a list of them, and refer the following terms to their proper category—man, shall, vice, here, to-morrow, fever, wading, red, upside down, heavier.

5. Define a syllogism. What is meant by (*a*) figures of the syllogism, (*b*) moods of the syllogism, (*c*) enthymeme of the first order, (*d*) regressive sorites ? Give examples of (*c*) and (*d*) and state and prove the special rules of the regressive sorites.

6. Prove that (*a*) the mood IEO violates the special rules of all the figures, (*b*) the mood AEO is superfluous in every figure, (*e*) wherever the minor premiss is negative, the major must be universal.

7.   What do you understand by a fallacy ? Explain the nature of the following fallacies, giving an example of each : (a) fallacy of division, (b) fallacy of composition, (c) *petitio principii.*

8.   Arrange any *three* of the following arguments in logical form and estimate their validity :—

(a) If a child is spoilt he is always unhappy, for all spoilt children are selfish.

(b) Improbable events happen every day. But what happens every day is a very probable event. Therefore improbable events are very probable events.

(c) If a man is educated, he finds manual labour distasteful. Consequently if education is ever universal, industry will cease.

(d) Giving advice is useless—for either you advise a man to do what he already intends doing, in which case your advice is superfluous—or else you advise him to do what he does not mean to do, and the advice is ineffective.

INDUCTIVE LOGIC

1.   Having observed that several magnets attract iron, you conclude that *all* magnets attract iron. Set out the grounds or reasons for your conclusion.

2.   (a) Suppose that a healthy man goes to live in a new locality and there loses his health. How

would you proceed to separate the essential from the non-essential circumstances in regard to his loss of health ?

(b) What is an Experiment ? Illustrate some of the advantages that Experiment possesses over Observation.

3. Define Hypothesis. In what sense can an Hypothesis be said to be *proved* ? Illustrate the meaning of the term ' Circumstantial Evidence' as applied to the trial of a man charged with a crime in a Court of Justice.

4. What common purpose is served by the so-called Inductive Methods ? What Method or Methods would you employ to investigate the following cases ; and what conclusions would you draw ?

(a) A man is observed to suffer from palpitation of the heart when using tobacco, but to recover from his ailment when he discontinues the use of tobacco.

(b) A number of boys in the same class of a school fail to pass their examination in a given year. It was found that the attendance of each of these boys had been extremely irregular during the year.

(c) A number of cholera patients in a certain town agree *only* in the circumstance of having used water from the same source—W. A number of persons also living in that town continue to be free from cholera and agree *only* in the circumstance of not having used water from the source—W.

5.   What is a Fallacy ? Examine the validity of the following statements :—

(a) A sharp taste must be caused by the sharp particles of the body tasted.

(b) The Earth cannot possibly be moving round the Sun : for we *see* that the Sun is moving round the Earth.

(c) I wore an amulet (tawiz, rakshabandhan) and escaped the Plague. Therefore the amulet was the cause of my escape.

DEDUCTIVE LOGIC—1913

[Not more than SIX questions to be attempted, of which one must be question 8.]

1.   What is a Law of Thought ?   Explain the meaning of the three fundamental Laws of Thought and show how they are applied in Deductive Logic.

2.   Define and illustrate any *five* of the following subjects—(a) Heads of Predicables, (b) Genus and Differentia, (c) Dichotomy, (d) Quantification of the predicate, (e) Epicheirema, (f) Sorites, (g) Enthymeme, (h) Dilemma.

3.   Explain and illustrate the meaning of the statement that the denotation of a term decreases as its connotation increases and *vice versa*.   In this connexion discuss the question of Proper names.

4.   State and explain by diagram (as far as possible) any three *different views as to the* Import of Propositions.

5.   (a) Infer as many propositions as you can from (i) No man is mortal, (ii) Ice is cold.

(b) What is the logical relation between the propositions (i) 'Only graduate are eligible' and (ii) 'Some graduates are eligible' ?

6.   (a) Prove that in the First Figure (i) the Major Premise must be universal, (ii) the Minor Premise must be affirmative.

(b) Prove that in every figure, if the Minor Premise is negative, the Major Premise must be universal.

7. What is Reduction ? Explain by concrete syllogistic example the process of Indirect Reduction as applied to Bokardo.

8. Criticize the following arguments, indicating what fallacy, if any, is illustrated by each :—

(a) Food which is not cooked is not wholesome ; this food is not cooked ; therefore it is not wholesome.

(b) The formal study of Logic is useless, for many persons who have never studied Logic can reason shrewdly and accurately.

(c) The people of the country are suffering from famine, and as you are one of the people of the country, you must be suffering from famine.

(d) We must reject the advice of this man, for his character is not good.

(e) It is foolish to tell a lie, for honesty is the best policy.

INDUCTIVE LOGIC

[Only SIX *questions in all to be attempted, of which question 2 must be one.*]

1. What is the use of collecting a *large number* of instances of a phenomenon ? Does the number of the instances add to the probability of the conclusion in all cases ? Why is it useful to ' vary the circumstances ' in making observations ?

2. (a) I find that the trees on the north side of a hill grow thickly while those on the south side

are few and scattered.   On examining other hills
I find that this is always the case.   I conclude that
trees *tend* to grow more thickly on the north side
of hills.

What kind of argument is the above ?   Why are
the words ' tend to ' inserted in the last sentence ?

(*b*) The war between Athens and Sparta was a
war between a sea-power and a land-power, and it
lasted a long time.   Therefore it might have been
inferred that the first war between Rome and Car-
thage, which were military and naval powers respec-
tively, would last a long time.

What kind of inference is this ?   Is it a strong
argument ?   When are arguments of this kind valu-
able ?

(*c*) Many of the pine-trees in certain districts
grow with twisted, instead of straight, fibre.   In
order to discover whether the twisting of the fibre is
hereditary, or due to the place in which the trees
grow, the seed of the twisted trees is taken and
planted in a number of different districts.

On what principle is this experiment based ?   Is
it likely to lead to a *certain* conclusion ?

3. Explain the terms—Law, Uniformity, Cause.
Examine into the use of the word Cause in the fol-
lowing :—

(*a*) The cause of his mistake was ignorance.

(*b*) The cause of a fall of stone is the universal
Law of Gravitation.

(c) The cause of a man's writing a book is that he has plenty of time.

4. What is the general nature of an Argument from Analogy ? Set out at length an instance of an Argument from Analogy.

5. The apparent daily movement of the sun round the earth is explained as due to the earth's rotation (turning round on its own axis). The Greek poets, however, explained it by saying that the Sun-god drives his bright chariot daily across the sky. Why do we call the former explanation *scientific*, and not the latter ?

6. Point out the causes of any errors in the following cases : —

(*a*) Having constantly observed a full moon when the sky was clear, I assert that the weather is always fine when the moon is full.

(*b*) ' A pearl dissolved in vinegar is sure to be a very valuable medicine.

(*c*) ' The Spartans were the most warlike among the Greeks, and were distinguished from the rest of the Greeks by the severity of their education. This severe training was therefore the cause of their warlike spirit.'

7. (*a*) ' The same effect is always produced by the same cause.' (*b*) ' Different effects may be produced by the same cause.' Illustrate these statements, pointing out in what sense each is true.

8. How do *negative instances* (cases in which a phenomenon is absent) assist in the discovery of the cause, or effect, of the phenomenon ?

DEDUCTIVE LOGIC—1914

[Not more than SIX *questions to be attempted, of which*
one must be question 8.]

1.   What do you understand by the terms
Science, Law, Thought ? Examine the applicability
of the scholastic formula *A* is *A* to any actual judg-
ment.

2.   Point out the ambiguity of the term Con-
notation and the disputes arising therefrom. ' A
genus must have the qualities of · *all* its species.'
How does this affect the view that intension and ex-
tension stand in inverse relation ?

3.   Make a division of a rectilineal figure to
include square, polygon, rhombus, triangle, parallelo-
gram ; and give the logical definition of each.

4.   What is Inference ? Is there any infer-
ence in the Opposition or Conversion of Proposi-
tions ?

Put into logical form and give the contraposi-
tive, contrary, and contradictory of —

(*a*) A man may smile and smile and be a
villain.

(*b*) No news is good news.

(*c*) What cat's averse to fish ?

(*d*) Not every case of plague is incurable.

(*e*) Our remedies oft in ourselves do lie.
That we ascribe to heaven.

5.   Throw the following arguments into logical
form and reduce them to the First Figure : —

(a) He would not take the crown ?

Therefore 'tis certain he was not ambi-
tious.

(b) Ramchandra of Delhi is a proof that
science and religion are by no means incompatible.

6.   Distinguish between a weakened and a
strengthened syllogism. Determine whether E A C
is weak or strong in each of the figures.

7. (a) Two Premises differ in quantity and
quality ; if the one is Major, the syllogism is valid
in every figure but if the other, the syllogism is
valid in none.   Find the Premises.

(b) The conclusion being universal, what do
you know about the distribution of the middle
term ?

(c) Prove that, when the Major term is
Predicate in its own Premise, the Minor Premise is
affirmative.

8. Examine the logic of—

(a) An atom is an indivisible portion of
matter.

(b) Every rule has an exception.

(c) It is good to have a holiday. The longer
the vacation then the better.

(*d*) There is always sure to be a good crop if there is a good monsoon. We are to conclude therefore that those districts will suffer severely, for there has been no rain.

(*e*) What is the good of all this education? Every day you hear of a crime that would never have been committed if its author had never learnt to read or write.

(*f*) If all the sons and daughters of the motherland were always content to be carried along the lines of least resistance we should never have any progress at all. But if a country is to have a future there is bound to be progress. It is therefore obvious that none of the sons, or daughters either, of any country that has a future before it, can afford to continue to be carried along the lines of real resistance.

INDUCTIVE LOGIC

[NOTE.—SIX *questions, and not more, must be answered, of which the third question must be one.*]

1. What part is played by hypothesis in Inductive Reasoning? What is meant by the verification of a hypothesis? Give an example of the verification of a hypothesis. Does verification ever give complete proof of the truth of a hypothesis?

2. By what characteristic do you distinguish Inductive Inference from other kinds of Inference? State with reasons, whether Analogy and Complete

Enumeration are to be considered as Inductive Inferences.

3. In the following passage state (a) the conclusion suggested, (b) the reasons given ; pointing out what is inductively established, and what is merely hypothetical ; and suggesting any further steps by which the hypothesis could be tested :—

'The cause of the disease known as goitre has always been obscure. One of the feature of the disease is its limited geographical distribution. It has often been remarked that the districts where goitre abounds are those in which limestone rocks are found. It is now suggested that this is not on account of any chemical relation between limestone and the disease, but is due to the fact that limestone is exceptionally porous and contains much organic matter. The *immediate cause* of the disease is supposed to be a living organism, and it is thought that this disease producing organism lives in the organic matter and filters down through the porous limestone into the streams and wells which furnish the people with drinking-water. As in the case of typhoid fever, attention to the water supply is the most obvious precaution for the prevention of the disease, *although the possibility of both diseases being conveyed in other ways also must not be lost sight of.*'

Comment on the last clause. Could the disease have different 'immediate causes' in different cases ?

4.   Explain and illustrate any *three* of the following statements :—

(*a*) In an experiment the new antecedent or antecedents introduced must be definitely known.

(*b*) A hypothesis must be verifiable.

(*c*) What is *observed* must be distinguished from what is *inferred*.

(*d*) We notice how often an event occurs, but fail to notice the cases in which it does not occur.

(*e*) The phenomenon under investigation should be, as far as possible, isolated.

(*f*) Effects must not be confused with causes.

5.   Explain, with an illustration, how the following principles are applied in Inductive reasoning :—

(*a*) Whatever cannot be eliminated without the disappearance of a phenomenon, is causally connected with it.

(*b*) Whatever can be eliminated without the disappearance, of the phenomenon, is not causally connected with it.

6.   How would you distinguish Simple Enumeration from the Method of Agreement ?

Why are both these kinds of inference liable to error ?

7.   Discuss the statement that ' all inference is from particulars to particulars.'

DEDUCTIVE LOGIC—1915

[Not more than SEVEN *questions to be attempted,
of which* FIVE *must be taken from* Group A
and TWO *from* Group B.]

A

1.   How do the laws of thought differ from other kinds of laws? Show how they are applied in conception, judgment, and inference.

2.   What are the principal views which have been held of the import of Proposition? Which do you consider the most satisfactory, and why?

3.   Examine Mill's view that the syllogism involves the fallacy of begging the question.

4.   Give the meaning of, and one example each of *four* of the following :—dichotomy, sub-contrary, property, illicit process, equivocal camestres, weakened conclusion.

5.   Criticize the following divisions and definitions :—

(*a*) Books divided into cheap, historical, printed, French.

(*b*) Knowledge is power.

(*c*) Man divided into head, body, arms, legs.

(*d*) Triangle divided into scalene, equilateral.

(*e*) A washerman is a person who takes in washing.

(*f*) Life is the continuous adjustment of inner to outer relations.

6. Under what heads of predicables would you class the predicates of the following Propositions, and why?—

    (a) Men are mortal.

    (b) This wood is teak.

    (c) A triangle has the interior angles equal to two right angles.

    (d) Shakespeare was a native of Stratford-on-Avon.

    (e) He has got his clothes on.

    (f) Courage is a moral quality.

7. Draw all the conclusions you can by the various forms of immediate inference which are applicable from—

    (a) All is not gold that glitters.

    (b) Silver is heavy.

8. Prove—

    (a) that every syllogism must have at least one universal premiss;

    (b) that every syllogism must contain at least three and not more than three terms;

    (c) that the middle term must be distributed once at least in the premisses.

B

2. Put into strict logical form and convert, naming the kind of conversion applied in each case:—

    (a) There is no fool like an old fool.

(b) None but residents of the United Provinces are eligible.

(c) Slow and steady wins the race.

(d) Only the actions of the just
Smell sweet and blossom in the dust.

(e) A fool and his money are soon parted.

(f) Few criminals thrive.

10.   Give the conclusion of the following pairs of premises, assigning the completed syllogisms to their moods and figures, and prove by reduction, where necessary :—

(a) Englishmen like to eat frogs.
All Frenchmen like to eat frogs.

(b) All clear explanations are satisfactory.
Some excuses are unsatisfactory.

(c) Some snakes are poisonous.
All poisonous creatures are to be avoided.

(d) No philosopher are illogical.
All illogical persons are obstinate.

11.   Put into strict logical form and criticize the validity of the following arguments, pointing out the fallacy, if any :—

(a) I must either starve or go to prison, for if I don't steal this loaf I shall starve, and if I do steal it I shall be sure to be caught by the police.

·(b) This must be a good book, because it has such a large sale.

(c) You'll know better when you grow older.

(d) All wealth is produced by labour ; therefore all wealth ought to go to the working classes.

(e) John Brown is the best student in England, for he is the best student in Brazenface College, which is the best college in Oxbridge University, which is the best University in England.

(f) When did you leave off playing the fool ?

INDUCTIVE LOGIC

[N. B.—*Questions 1 and 5 only of the rest must be answered.*]

1. Examine the following cases and indicate the Methods employed in your solutions :—

(a) Some historians have ascribed Greek colonization to party strife, others to economic reasons, in particular to the inadequacy of the soil to meet the needs of a growing population. The evidence points to both these factors as having been at work in the IXth and VIIIth centuries B. C. Agricultural depression grew especially acute towards the close of the VIIIth century which also witnessed great colonizing activity. This activity finished abruptly with the VIth century. Meanwhile party strife did not cease, but continued considerably later. The economic prosperity of the great centres from which colonies were sent, reached a high level in the VIth century owing to industrial and commercial enterprise, and to the removal of many agricultural abuses.

What was the cause of Greek colonization?

(b) Last year I took quinine regularly and was free from fever; this year I took no quinine, and had fever. But last year I also smoked, and this year I did not.

How am I to decide what was the cause of my freedom from fever?

(c) Dr. A. cured a fainting fit with Whisky and Soda; Dr. B. cured another fainting fit with Brandy and Soda.

What valid conclusion can you draw from these two cases as to the cause of curing a fainting fit?

(d) When a man trembles, he feels fear; when he does not tremble, he does not feel fear. Moreover, when a man finds himself in a dangerous situation, he feels fear: and when he does not find himself in such a situation, he does not feel fear.

What do you infer from these facts as to the causation of fear?

2. Define and distinguish between induction and deduction. To what extent does each depend on the other?

3. Why may all true inductive inference be said to be precarious and liable to error? Can this charge be satisfactorily refuted?

4. What is meant by saying that the Law of the Uniformity of Nature is the ultimate major premiss of the Inductive Syllogism? Illustrate your answer with instances.

5. Examine the following lines of argument, and indicate their nature, validity, and value :—

(*a*) My father, grandfather, and great-grandfather died.   Therefore I also shall die.

(*b*) My father, grandfather, and great-grandfather became bankrupts.   Therefore I also shall become a bankrupt.

(*c*) I am like my father.   My father died young. Therefore I also shall die young.

6. Define and distinguish between a Law of Nature and Hypothesis, using examples.   What conditions must each satisfy to be valid ?

7. Distinguish between Observation and Experiment.   Indicate what advantages are possessed by Observation over Experiment and by Experiment over Observation.   Illustrate your answer with examples.

8. What is meant by the method of Agreement ? What objection can be raised against its validity ? How far can the defect implied in this objection be remedied ?

DEDUCTIVE LOGIC—1916.

[SIX *questions to be attempted, of which one must be question 7*].

1.   What definition of logic seems to you to state most accurately the nature of that study? Give one or two other definitions that have been suggested, and explain why you prefer your own.

2.   Express the following propositions in exact logical form, and say which terms are distributed :—

(*a*) No one looks poetical unless he is pale.

(*b*) Some dishes are unwholesome when not well cooked.

(*c*) Uninteresting books make us sleepy.

(*d*) When a man is wide awake he can detect a fraud.

(*e*) No riddles interest me, if they can be solved.

(*f*) Only fools think themselves infallible.

3. Distinguish between the following, giving examples in each case :—

(*a*) Major term and minor term.

(*b*) Genus and species.

(*c*) Property and accident.

(*d*) *Modus tollens* and *modus ponendo tollens*.

4.   What do you understand by Immediate Inference ? Note briefly the most common forms, and give the converse, obverse, and contrapositive of—All cows are ruminants.

5. Examine the moods *AAA*, *EIO*, and *IEO* throughout the figures, showing where they are valid or invalid, and for what reasons.

6. What do you understand by Reduction? What is its value? Express the following enthymemes in syllogistic form and reduce them to the first figure :—

(*a*) Spiders are not insects, for they have not six legs.

(*b*) Some water animals are mammals since all whales are.

7. Explain the logical nature of the · following arguments, naming any fallacies that are involved :—

(*a*) The prisoner's guilt is proved by his trying to establish · an alibi, which is what guilty men always do.

· (*b*) I shall not succeed because I am not self-seeking.

(*c*) You have no right to say my subscription is small, for you yourself have contributed nothing.

(*d*) The English are a free people. Therefore no Englishman is ever in prison.

(*e*) If we are to believe philosophers, knowledge is impossible ; for some tell us we can know nothing of matter, and the rest that we can know nothing of mind.

(*f*) It is right to give to beggars, because charity is a virtue.

(*g*) Those who assert that medical treatment is useless to the sick are self-deceived, or else deceivers of others, according as they do or do not believe their own assertions.

(*h*) It is for the benefit of society that laws should be enforced. Criminals are the occasions of laws being enforced, and are consequently public benefactors.

(*k*) The drinking of alcohol should be prohibited by law, since it is the cause of poverty and misery.

(*l*) Punishment is useless; the good do not need it, and the bad are unaffected by it.

INDUCTIVE LOGIC

[N.B.—*The* WHOLE *of Part I must be answered* FIRST: *then* FOUR *questions only of Part II must be answered.*]

PART I

1. Examine the following cases, and indicate in your solution any of the methods that may be employed:—

(*a*) A feather falls simultaneously with a rupee in a vacuum, and more slowly than it in air. What inference can you draw from this?

(*b*) 'I say it is granted on all hands—and what happens in dreams and the like put it beyond dispute —that it is possible we might be effected with all the ideas we have now, though there were no

(material) bodies existing without (*i. e.*, outside the mind), resembling them.'

How far is Barkeley justified in arguing from this that material bodies do not cause our ideas?

(c) ' It would be an imperfect and unsatisfactory experiment to take air of which the oxygen has been converted into carbonic acid by the burning of carbon, and argue that because an animal dies in such air oxygen is the cause of respiration.'— (JEVONS.)

Why is this true? Suggest a better experiment to prove the same truth.

(d) Dickens observed that poverty and oysters (an expensive kind of fish) always went together; the suggestion being that poverty was the reason why the luxury of oysters was indulged in.

Why other explanations of this uniformity of co-existence can you suggest?

(e) The earth attracts the moon ; therefore the moon will fall upon the earth.

What may this inference be untrue?

(f) A student whom you know to have worked hard, fails in his examination.

How would you propose to account for his failure?

2. Examine carefully the nature, validity, and value of the following lines of argument :—

(a) England, Wales, Scotland, and Ireland are mountainous; England, Wales, Scotland, and Ireland

constitute Great Britain ; therefore Great Britain is mountainous.

(b) These splints cured John's broken leg ; they will therefore cure Jane's broken heart.

(c) Time flows like a river ; a river carries down light and inflated things, but lets solid and substantial things sink; therefore Time carries down light and inflated writings, but lets solid and substantial writings sink.

(d) As we dig deeper into the earth it gets hotter ; moreover we find such phenomena as volcanoes and hot springs scattered over the earth's surface. The earth therefore contains fire in its interior.

Part II

1. ' Observation as it generally employs the Method of Agreement may only establish Empirical Laws : but Experiment by employing the Method of difference conclusively establishes Causation.'

Explain, examine, and illustrate this statement.

2. What is meant by the Law of the Uniformity of Nature ? Criticize Mill's proof of its validity. Can any other proof be suggested ?

3. Show how deductive inference is involved—
   (a) in the Inductive Syllogism ;
   (b) in the Inductive Methods.

4. What is meant by Analogy ? How would you distinguish it from Induction ? Explain and examine the statement that every Inductive argument

is really analogical.   Illustrate your answer with examples.

5. Explain and illustrate the following terms :— Scientific Classification, Plurality of Causes, Crucial Experiment, Negative Instance, and Heterogeneous Effects.

·6. What is Explanation ?   Illustrate and give meaning of the statement that ' Science converts empirical laws into derivative laws.'

7. Indicate the risks involved—

(a) in inductive inference generally ;

(b) in actual research on inductive principles.

DEDUCTIVE LOGIC—1917

*Six questions to be attempted, of which question 7
must be one.*]

1. Explain what is meant by the connotation
and the denotation of a term. Have abstract terms,
any denotation ? Have proper names any connota-
tion ?

Give reasons for your answers.

2. What do you understand by physical division,
logical division, basis of division, cross-division ?
Explain what is meant by division by dichotomy,
and estimate the value of the method.

3. Put the following propositions into strict
logical form. Convert (*a*) and (*b*) ; obvert (*c*), and
give the contraposition of (*d*) :—

(*a*) Only imaginative men can be great states-
men.

(*b*) Most stamps are perforated.

(*c*) All magistrates are not sympathetic.

(*d*) The ox chews the cud.

4. Prove that (*a*) the mood *IEO* violates the
special rules of all the figures, (*b*) the mood *AEO* is
superfluous in every figure, (*c*) whenever the minor
premiss is negative, the major must be universal.

5. (*a*) Construct a syllogism in Baroco to prove
that strikes are not justifiable, and reduce it by the
indirect method.

(b) Construct a syllogism in Disamis to prove that some literature is pernicious, and reduce it to the first figure.

6.   Explain, with examples, the various forms of the so-called hypothetical and disjunctive syllogisms, and show how hypothetical and disjunctive propositions can be reduced to the categorical form.

7.   Examine the following arguments naming any fallacies that may be involved :—

(a) It is the business of the State to enforce all rights ; charity is right and should therefore be enforced by the State.

(b) Few men die over eighty ; I am over eighty and therefore shall probably not die.

(c) No one was ever improved by being punished since punishment is essentially degrading.

(d) Grass is green and green is a colour. Therefore grass is a colour.

(e) War is an appalling evil and therefore men ought not to be trained to the use of arms.

(f) I cannot accept your doctrine as true, for it is evident that its general acceptance would be attended with the most injurious consequences to society.

INDUCTIVE LOGIC

[N. B.—*The* WHOLE *of Part I must be answered* FIRST ; *then* FOUR *questions only of Part* II.]

PART I.

1. Examine the validity of the following arguments, pointing out the methods employed, and the fallacies, if any :—

(*a*) Consumption was unknown in Tabiti before Europeans came to live there. Since then, the population has been reduced fifty per cent. through the ravages of that disease. Therefore. the disease was. introduced through contagion from Europeans, among whom it was known to exist previously.

(*b*) *X* studied a certain annotated edition of a text-book, and passed his examination. X confined himself to the study of the text, and failed. Therefore this edition is essential in order to pass the examination.

2. (*a*) When a safety match is rubbed lightly on the prepared surface of the box, it bursts into flame. Examine fully the cause of this phenomenon.

(*c*) What logical process or processes would you use in order to form some conclusion as to whether the moon and the planets are inhabited ? Work out a typical example in detail.

(*c*) " All crows I have ever seen or heard of are black, therefore all crows are black.' Of what logical process is this an example ? Estimate its value and limitations.

(d) Last year in a certain district 12,500 letters passed through the post office, and in the same district, fifty patients were admitted to the local lunatic asylum. Five years ago the number of letters delivered was 9,375 and the number of lunatics admitted thirty-seven. This shows that excessive correspondence has a tendency to unhinge the mind. Examine the validity of the above argument.

PART II

1. In what way is Induction involved in the following argument :—Water is necessary for the growth of vegetables ; sandy deserts have no water ; therefore vegetables cannot grow in sandy deserts ?

2. What are the chief defects of the Method of Agreement ? Show by examples how they may be remedied.

3. Bain says ' In no case is the Inductive Syllogism an admissible logical form.' Argue the question, giving illustrative examples.

4. ' The difference between observation and experiment is rather one of degree than of kind.' Illustrate and explain this statement. What is meant by saying that there are some sciences of nearly pure observation ?

5. What are the requisites of (a) a good classification, and (b) a good scientific nomenclature ? What is meant by saying that classification implies abstraction ?

6. What are the rules for testing the value of a hypothesis ? Show by examples the difference between a scientific hypothesis and a mere guess.

DEDUCTIVE LOGIC—1918

[Six *questions to be attempted, of which* ONE *must be*
Question 7.]

1.   What do you understand by the Connotation
and the Denotation of a term ? How are these
related ?   Illustrate.

Has a Proper Name Connotation ?   Illustrate by
reference to the following :—

Delhi, Abbottabad, Punjab, John, Johnson, Bot-
tlewala.

2.   What is meant by Definition per Genus et
Differentiam ?

Why is it that some Terms can be defined and
others cannot ?   Discuss   the   definability of the
following :—dog, comet, Asoka's Pillar, will, mar-
riage.

5.   Resolve the following propositions into logi-
cal form and indicate the quality and quantity of
each resulting proposition :—

(*a*) Bombay is the only town in India, except
       Calcutta, which has a population of a
       million.

(*b*) Only the brave deserve the fair.

(*c*) Hardly any of the candidates took a First
       Division.

(*d*) It is as false to say that Bengalis alone
       among Indians are versatile, as to say
       that Bengalis alone are not.

4. Give the meaning of the following with examples ; Dichotomy, Subcontrary, Bokardo, Illicit process, Sorites.

5. Give the Converse, Obverse, and Contrapositive of—

(a) none but graduates are eligible.

(b) most snakes are not poisonous.

6. From the general syllogistic rules prove—

(a) In the First Figure, the conclusion must have the quality of the major premise and the quantity of the minor.

(b) In the Third Figure, the conclusion must be particular and have the quality of the major premise.

(c) When the minor term is predicate in its premise, the conclusion cannot be *A*.

7. Construct an argument in Bramantip and reduce it to the first figure.

8. Construct a Disjunctive Argument of the form—

Every *A* is either *B*, or is not *C* ;

These *A*'s are *C* ;

Therefore, etc.

Reduce your concrete example to the Conditional form and the latter to a Categorical Syllogism.

What is the name of the Conditional form, and of the mood of the Categorical Syllogism ?

9.   Examine any *five* of the following arguments, naming any fallacy which may be involved :—

(a) It can be shown that the weavers of India would be benefited by Protection; similarly the shoe-makers and every other trade; therefore Protection would be a benefit to India.

(b) Every planet moves round the Sun; Jupiter moves round the Sun; therefore Jupiter is a planet.

(c) War is productive of evil ; therefore peace is likely to be productive of good.

(d) The prisoner pleads he did not steal the goods. But why, I ask, did he hide them, as no thief fails to do.

(e) When a man is educated he does not wish to work with his hands; therefore if Education were universal; industry would cease.

(f) Nothing is heavier than Platinum; feathers are heavier than nothing; therefore, feathers are heavier than Platinum.

(g) A is 5 miles north of B ; C is 5 miles east of B ; therefore C is south-east of A.

INDUCTIVE LOGIC

[The whole of Part I must be answered FIRST*; then* FOUR *questions* ONLY *of Part II.]*

PART I

1.   Examine the nature, validity, and value of the following arguments :—

(a) The European war is a sufficient reason for the increase in the price of food in neutral countries during the years 1914—1917.

(b) There are many instances of comets and eclipses being seen immediately before the death of famous persons; therefore such phenomena may justly be regarded as foretelling the death of some great man.

(c) Only those fruits should be eaten which are palatable in the natural uncooked state, since before man learnt the art of cooking he must have followed this rule.

(d) As plants naturally grow upwards, towards the sun, so it is consistent with man's nature to follow the light of reason.

(e) Physical exercise is not an essential part of education; for very learned men have existed who never took systematic exercise, and great athletes are sometimes very ignorant people.

2.   (a) Criticise in detail the following argument :—

   " It is natural for every man and woman to live at least a century. The fact that thousands have

done so proves that the majority might attain that age if they would cease from transgressing nature's laws···Instead of being in our dotage when we reach three-score years and ten, we should still be fit to serve our day and generation."

(b) A having walked thirty miles at the rate of four miles an hour, challenges B to improve upon this performance. B walks thirty-five miles at the same rate, but next day he becomes ill, and is told that he has strained his heart. This shows it is safe to walk thirty miles, but no more, at that speed.

PART II

"A perfect experiment establishes a law." On what grounds does this certainty of inference rest? What are the difficulties in securing data of the kind required?

2. What are the objects of classification, and why is it more important in some sciences than in others? What is dichotomy, and what disadvantages attach to its use?

3. Point out with illustrations the main differences between the scientific and popular conceptions of cause.

4. Show how the method of agreement differs from simple enumeration. Is the latter of any scientific value at all? What are the main defects of the method of agreement?

5. Explain the method of residues, and indicate its special value.

6.   Explain and illustrate the method of estimating the value of an analogy.

7.   Distinguish between a "working" and an established hypothesis, showing the basis of the latter.

LOGIC—1919

First Paper (Deductive Logic)

Six questions to be attempted, of which ONE
must be question 9 (nine).

1. What do you mean by a *Law of Thought*:
Show how the *Law of Identity* and the *Law of Contradiction* are involved in the mood Celarent.

2. Distinguish between the following illustrating each case by examples :—

    (*a*) A Negative Term and a Privative Term.

    (*b*) A Contradictory Term and a Contrary Term.

    (*c*) A Difference and a Property.

    (*d*) A Definition and Description.

    (*e*) A Logical Division and a Classification.

3. Criticise the following as Logical Divisions :—

    (*a*) India into North India, Deccan, Malabar Coast, and the Carnatic.

    (*b*) Indian Languages into Aryan, Dravidian, and others.

    (*c*) Games into those played with balls and those played without balls.

    (*d*) Men into those who lend and those who borrow.

4. In a Negative Proposition does the Negative Particle belong to the Copula or to the Predicate ?

Give reasons for your answer and show how it bears on the subject of Immediate Inference.

5.   What Immediate Inferences may be drawn from the Proposition—No great scientist is without imagination? Name the process in each case.

6. (a) If in a syllogism the Major Term be Universal in the Premises and Particular in the Conclusion, determine the Mood and Figure, it being understood that the Conclusion is not a weakened one.

(b) Aside from the special rules of the Figure, why cannot O stand as a premise in the First Figure ?

7   Construct a concrete Syllogism in Felapton and reduce it to some mood in the Second Figure.

8.   In a Hypothetical Syllogism show why it is wrong to argue from the affirmation of the consequent to the affirmation of the antecedent. Illustrate your answer by a concrete example.

9.   Examine any *five* of the following arguments, completing them where necessary, and pointing out any fallacies which may be involved :—

(a) In this district a much larger percentage of female candidates passed their examinations than male candidates ; therefore the young women of this district are more intelligent than the young men.

(b) I am sure that Rama did this for only mischievous boys act in this fashion, and Rama is the most mischievous boy in the school.

(c) If all students were clever there would be no need for Examinations, but alas, many are stupid and so Examinations cannot be abandoned.

(d) You say that only Tories advocate Tariff Reform. He must be a Liberal, then, for he opposes Tariff Reform.

(e) This clock must be for it has just been set right by the ' Time-gun.'

(f) Since the construction of the Suez Canal, Great Britain has had continual trouble in Egypt; therefore this canal is the source of the trouble.

(g) " What would our ancestors say to this measure ? How does it agree with their experience ? Are we to put the wisdom of yesterday in competition with the wisdom of centuries ? "

SECOND PAPER (INDUCTIVE LOGIC)

Six questions to be attempted, which must include questions 1 and 2.

1. Examine in detail the following argument, and give your opinion as to the validity of the conclusion :—

" As to the quantities of sleep necessary, the amount habitually taken .....differs at different ages. Babies sleep a good part of the 24 hours, and probably schoolboys and school girl under present conditions of life and work ought to be given ten hours or more. Whilst adult men sleep from 6 to 9 hours, old people (not very old, but those of 65 or thereabouts)

often find themselves unable to sleep for more than four hours at night, and take an hour or two in the daytime to make up for the deficiency. The cessation in early old age of the desire for more than half the amount of sleep taken by younger men suggests that the regulating cause of the number of hours which are needed for sleep may be simply the actual amount of work done by body and mind."

2. Examine the following inferences, state the method or methods employed in forming them, and estimate their validity :—

(i) No part of the evidence against the prisoner is, by itself, enough to prove him guilty ; therefore he should be acquitted.

(ii) Two students sitting near each other in an examination get identical incorrect answers to two problems in the paper ; therefore one has the copying from the other.

(iii) This triangle, I find on examination, has been sum of its angles equal to two right angles. Therefore the sum of the angles of every triangle are equal to two right angles.

(iv) The amount of tonnage destroyed by enemy submarines was exceeded last month by the output of new ships from shipbuilders. Therefore the submarine menace is at an end.

(v) The night will be calm, for the moon is full.

3.   Distinguish an empirical from a derivative and an ultimate law. With what degree of confidence can we extend an empirical law to a new case ?

4.   Explain fully all that is implied in the statement that observation is selective and involves judgment and inference.

5.   What do you understand by Cause ? Illustrate your answer by reference to concrete cases.

6.   What is the difference between a natural and an artificial classification ? What is a descriptive terminology ? Mention any sciences which are deficient in this respect.

7.   " It is impossible to restrict oneself to the use of any single one of Mill's methods in any enquiry." Is this statement true, and if so, why ? Illustrate.

8.   " Induction gives us principles ; deduction applies them."

Do you consider this an adequate statement of the relation between deduction and induction ? If so, explain and illustrate it. If not, show wherein it is deficient.

9.   Explain clearly and illustrate *three* of the following :—

  (a) the " personal error " in observation ;

  (b) false analogy ;

  (c) crucial experiment ;

  (d) negative results of experiment.

DEDUCTIVE LOGIC—1920

SIX *questions to be attempted, of which one must be Question* 10 (*ten.*)

. 1. Give with explanations what you consider a satisfactory definition of *Logic*.

What is the value of Logic ? What is meant by saying that Logic deals only with the *form* of thought ?

2. Explain the distinction between the intension and the extension of terms. What is the meaning of the statement that as the one increases, the other decreases ; and what are the limits to the accuracy of the statement ?

3. Give a logical definition of the following : planet, microscope malaria, contrapositive, liar, dichotomy.

4. Reduce the following proposition to logical form and give its obverse, converse, contrapositive, contrary, and inverse ; There is no possibility of serious opposition to such a proposal.

5. Comment on the following statement : " genus is a part of species, and species is a part of genus," illustrating your answer by examples.

6. " Boys being what they are, it is not easy for them to believe in the importance of what they are doing if they see that in fact it is not required of all their schoolfellows. From the schoolboy's point of view it is perfectly sound logic to argue

(4) The working classes would be greatly benefited by this measure. Consequently those who oppose it are enemies of the people.

(5) Men of full age and ordinary intelligence are surely capable of concluding a bargain for themselves without government interference. Therefore there is no need to fix the scale of fares for hired carriages.

(6) Those who beg for concessions in hesitating language do not really feel the need they profess; those who demand them with threats are unfit to enjoy the privilege they so rudely claim. But all requests must be made in temperate or in intemperate language. Therefore all must be resisted or all must be conceded.

· (7) No one could possibly believe a story so obviously of credence.

(8) *A* is next to *B*, *B* is next to *C*, therefore *A* is next but one to *C*.

INDUCTIVE LOGIC
Six *questions to be attempted, which must include Questions* 1 *and* 2.

1. Analyse the following example, so as to bring out the inductive character of the process by which the conclusion is reached :—

In worms the sense of smell apparently is confined to the perception of certain odours, and is feeble. They were indifferent to my breath as long as I breathed on them very gently. They exhibited the

same indifference to my breath whilst I chewed some tobacco, and while a pellet of cotton wool with a few drops of acetic acid was kept in my mouth. Pellets of cotton-wool soaked in tobacco juice and in paraffin were held with pincers and waved about within two or three inches of them, but they took no notice. As such timid creatures would almost certainly exhibit some signs of any new impressions, we may conclude that they did not perceive these odours.

2. Examine *three* of the following inference and estimate their value.

(*a*) Just as the flint and bone weapons of rude races resemble each other much more than they resemble the metal weapons and the artillery of advanced peoples, so the mental products. the fairy tales and the myths of rude races have everywhere a strong family resemblance.

(*b*) Oriental races are to a certain extent more spiritually inclined than those of the accident. Almost all the great movements in Indian history have been due directly or indirectly to religious influence. It is, therefore, concluded that a national sentiment will develop itself through these religious influences.

(*c*) In the year 1917 the number of patients admitted into a hospital was 920 ; in the year 1918 the number of patients admitted in the same hospital was more than double : it is therefore concluded that sickness is increasing in the district.

(d) The fruits of tropical countries are far sweeter than those of temperate regions. Heat is therefore the cause of sweetness.

3. Explain and illustrate the main difference between Deductive and Inductive reasoning.

4. What is the ground or postulate of Induction and how is it obtained ?

5. What do you understand by the immediate cause of an effect ? Can an event have more than one immediate cause ?

6. Explain any *three* of the following :—

       Vera causa,
       Working hypothesis,
       Crucial instances,
       Legitimate hypothesis,
       Scientific experiment.

7. What is meant by saying that the cause of an effect can only be proved by a process of elimination ? Do you consider that such process is involved in Mill's methods of Induction ?

8. Why are the observations of same observers more valuable than the observations of others ?

9. How far can we distinguish kinds of classification by reference to the purpose which they serve ? Show how Nomenclature and Terminology assist us in classification.

(a) The Earth revolves on its axis, so does Mars ; the Earth has a succession of seasons, so has Mars ; the Earth has snow-caps at the poles, so apparently has Mars ; the Earth is enveloped in an atmosphere, so is Mars.   Therefore, since the Earth is inhabited, so is Mars.

(b) ' I am a Jew.   Hath not a Jew eyes ? Hath not a Jew hands, organs, dimensions, senses, affections, passions ? fed with the same food, hurt with the same weapons, subject to the same diseases, hurt by the same means, warmed and cooled by the same winter and summer as a Christian is ? If you prick us, do we not bleed ? If you tickle us, do we not laugh ? If you poison us, do we not die ? and if you wrong us, shall we not revenge ? If we are like you in rest, we will resemble you in that.' (*Merchant of Venice*).

6.   Show that the Method of Difference is a more perfect method for testing the truth of a Hypothesis than the Method of Agreement.

7.   Show by an example how the ' Deductive Method ' is used to confirm conclusions arrived at by Inductive Processes.

8.   A series of observations having been made, the results were tabulated as follows : —

Antecedents.	Consequents.
ABDE	stqp.
BCD	qsr.

BFG	vqp.
ADE	tsp.
HK	xqw.
ABFG	pquv.
ABE	pqt.

What conclusions may logically be drawn the observations ? Give reasons for your answer

9. Examine any *three* of the following arguments, state the nature of the argument, and discuss its validity.

(*a*) A Civil Surgeon in order to test the value of two distinctive drugs divided the patients suffering from a certain disease equally between two wards in his hospital.   The patients were of the same sex and were assigned to the alternate wards in the order of arrival.   The wards were similarly situated and the patients received the same treatment except in the matter of medicine.   In one ward the percentage of recoveries was much higher than in the other.   The surgeon therefore concluded that the drug used in the first ward was a more potent remedy, though it was pointed out that the patients in the second ward had discovered that they were being made the subjects of an expriment.

(*b*) Co-operative Societies have been a success in British India, therefore they must be a *success* in the Native States.

(*c*) A gentleman met an old villager sunning himself before an English inn. The following conversation ensued :—

'Good day, George, and how are you ? A fine warm day for the month of April !

'Yes, Sir, it is, after the nasty storms of March.'

'You are getting to be an old man, George. How old are you now ? '

'Eighty-seven next December, but I'll live till then, I'm sure, Sir ? '

'You seem very certain about it.'

'Well, Sir, it's just this way. I have, noticed that if I got through March all right, why, I lived right through to the end of the year. I never failed once. No, Sir, I never failed once ! '

(d) Some years ago in Bombay, two cages of guineapigs were placed in a room in which there had occurred fatal cases of Bubonic Plague. The guinea-pigs had previously been inspected and pronounced free from all vermin. One cage was protected by thin wire gauze, the other was open. The next day the cages were removed and the animals examined. Those not protected by netting were found to be infested with 'rat fleas,' the others were not. In a few days the former developed plague and died. Many said immediately: "The 'rat flea' is the cause of plague," though the experimenters were more cautious in wording their conclusions.

(e) Sanskrit scholars were debating which of two 'readings' (different words) in a Vedic hymn was the correct and original version. They collected

4.   Give the converse, the contrapositive and the inverse of each of the following propositions :—

(1) Every circle is a conic section.

(2) No brutes are responsible.

(3) Two straight lines cannot enclose a space.

5.   Explain clearly the difference between categories and predicables.

Name the predicables in the following propositions :—

(1) The tiger is a predatory animal.
(2) Students are seekers after truth.
(3) Logic is the science of thought.
(4) Politicians are lovers of their country.
(5) A polar bear is an animal inhabiting the polar regions.

6. Find premises to prove the propositions given below, state the mood and figure of the syllogism you construct and state whether the same conclusion could be arrived at in any other syllogistic moods.

(a) Not all lazy people are unhappy.

(b) They also serve who only stand and wait.

7.   Prove that no syllogism in the 4th figure can be correct which has a particular negative among its premises, or a universal affirmative for its conclusion.

8.   Why cannot O stand as a premise in the first, as a major in the second, as a minor in the third or as a premise in the fourth figure ?

9. Examine the validity of five of the following arguments and statements, explaining and specifying fallacies if any :—

(a) The theory of evolution is true because it is accepted by every scientific biologist.

(b) The laws of Nature never can be broken. Social laws is a part of the general system of nature; therefore it cannot be broken.

(c) The holder of some shares in a lottery is sure to gain a prize, and as I am the holder of some shares in a lottery, I am sure to gain a prize.

(d) I will have no more doctors; I see that all of those who have died this winter have had doctors.

(e) " Crops requires the services of an officer who can speak Italian fluently for four or five day." (Advertisement in Punch.)

(f) "There may be some one among you who will be vexed when he remembers how he prayed and entreated the judges to acquit him with many tears and brought forward his children and many friends and relatives in court to appeal to your feelings, and then finds that I shall do none of these things." (What kind of argument does Socrates refuse to employ in his defence before his Athenian judges ?)

(g) He was too impulsive a man not to have committed many errors.

(h) It is injustice to the intellect of women to refuse them the suffrage; for the reigns of many queens have been famous for literary productions.

INDUCTIVE LOGIC.

[SIX questions to be attempted, one of which must be No. 9.]

1. Explain what is meant by the Principle of Causation and show how it is related to Inductive reasoning.

2. Distinguish between, and with the aid of examples display the characteristics of the following:—
Municipal Laws, Laws of Nature, Empirical Laws, Ultimate Laws.

3. How are Observation and Experiment related? Discuss their relative difficulty and importance.

4. Explain and illustrate each of the following: (a) perfect induction; (b) crucial instance; (c) argument from Analogy.

5. A certain school had 150 pupils on its roll. One morning the attendance suddenly fell to 50. The average attendance had been 130, the remaining 20 being accounted for by slight ailments, social engagements, and indifference. There was no epidemic or mela in the neighbourhood to account for the sudden drop. There had been, however, a number of political meetings in the town recently. So the Head-master concluded that this fact accounted for the unusual number of absentees.

By which of Mill's Methods was this conclusion reached?

From the example given show the characteristics and the defects of this Method.

6.   How would you proceed, by experiment or observation, to prove (or disprove) the belief that the stars have an influence on a man's life ?

(*N.B.*—The candidate may prove or disprove as he prefers.)

7.   Distinguish between Natural and Artificial Classification.   What is the value of each in Logic ?

8.   Analyse, state the nature of the argument, and criticise the reasoning in any *three* of the following :—

(*a*) Stories are frequently heard of a wonderful feat performed by Indian jugglers.   It is claimed that a rope thrown into the air retains its upright position.   A boy then climbs the rope and disappears.   Many years ago a learned society in Madras gave wide publicity to an offer of Rs. 500 to any one who could do the trick or prove that it had ever been done. As no one claimed the reward, the society took it as proved that the stories were false.

(*b*) In a mining town in the Western States of America the boast was made that, except through accident or foul play, there had been no deaths in the past three years.   It was claimed, therefore, that the town was exceptionally healthy.

(*c*) Persons coming into a district in which malarial fever is prevalent, usually remain free from malaria if they protect themselves from mosquito-bite while a large percentage of those who carelessly expose themselves to mosquito-bite contract malaria. Moreover in marshy districts in which malaria has

been prevalent malaria disappears in proportion as the water is drained away : and the mosquito can only breed in water.

(d) Several of my friends who passed the School-Leaving Certificate Examination in the second division have passed the Intermediate Examination in the second division.   Therefore I hope to pass the Intermediate Examination in the first division, having passed the School-Leaving Certificate Examination in the first division.

(e) It has been observed that as education spreads the number of crimes becomes less.   People therefore advocate universal compulsory education on the ground that thus crime will disappear.   But yet we see that many criminals belong to the educated classes, and that the majority of uneducated persons are not criminals.

DEDUCTIVE LOGIC.

[SIX questions to be attempted, of which No. 8 must be one.]

1.   Distinguish between a Science and an Art. To what extent is it true that Logic is both a Science and an Art ?

2.   "The more general a term becomes, the less it has of meaning."

Explain, illustrate and criticise this statement.

3.   Express the following propositions in logical form, distinguishing subject, copula, and predicate

and stating the quality and quantity : —

    (a) Only fools think themselves infallible.

    (b) All politicians are not statesmen.

    (c) Few persons are proof against temptation.

    (d) Nearly all the troops have left the town.

    (e) Uneasy lies the head that wears a crown.

    (f) Not every man can stand such hardships.

    (g) A burnt child dreads the fire.

4.   What is the nature of immediate inference? Give the contrary, contradictory, converse, obverse and contrapositive of "No illogical author is truly scientific."

5.   Prove the following special rules of the figures with illustrations to show the fallacies, that result from a breach of them.

    (a) In the Third Figure the conclusion must be particular.

    (b) In the Fourth Figure if either premiss is negative, the major must be universal.

6.   What do you understand by Reduction? Reduce the following syllogisms to the first figure.

    (a) All students of this class are well prepared. No idle students are well prepared.

Therefore No idle students belong to this class.

    (b) No fixed stars are planets. All planets shine brightly.

Therefore some brightly shining bodies are not fixed stars.

7.   Explain the nature of hypothetical and disjunctive propositions and illustrate the way in which a proposition in either of these forms may sometimes be expressed in the other and both of them reduced to the categorical form.

8.   Examine any *five* of the following arguments. pointing out and naming the fallacies, if any :—

(*a*) If their theories were sound, philosophers would agree among themselves.

(*b*) Good men write good books ; this is a good book and therefore its author must be a good man.

(*c*) No man wishes to suffer pain ; your friend cannot be cured without suffering pain, and therefore will not wish to be cured.

(*d*) If he is not guilty, why did he try to escape as guilty men always do ?

(*e*) The explosion was obviously due to gunpowder, as nothing else possesses sufficient force.

(*f*) In giving advice, you either advise a man to do what he already intends to do, in which case your advice is superfluous, or your advise him to do what he is resolved not to do in which case the advice is ignored.

(*g*) Not all educated persons spell correctly ; for spelling mistakes frequently occur in the papers of Intermediate candidates.

DEDUCTIVE LOGIC.—1923.

Time—Three hours.

[SIX *questions to be attempted, of which No.* 8
must be one.]

1.   What do you mean by Science? How
does scientific knowledge differ from ordinary know-
ledge? What claim has Logic to be considered a
science?

2.   " In defining we divide, and in dividing we
define." Explain in what sense this is true and illus-
trate your answer.

3.   Explain what is meant by the distribution
of terms, and discuss fully the 4 standard types of
categorical propositions from the point of view of
the distribution of their terms.

4.   Explain and illustrate the meaning of (*a*)
dichotomy, (*b*) category, (*c*) opposition (*d*) conver-
sion.

5.   Define a syllogism.

Explain what is meant by the figure and mood
of a syllogism.

State and prove the rules of the first figure.

6.   What is a sorites?

Put the following premises into the form of a
sorites and draw the proper conclusion :—

(*a*) All humming-birds are richly coloured.

(*b*) No large birds live on honey.

(c) Birds that do not live on honey are dull in colour.

7. State the following fully as dilemmas. To what types of dilemma does each belong and what other types are there ?

(a) There are two kinds of things we ought not to worry about ; we can help, and what we cannot.

(b) Laws are not necessary for pure men, while they are powerless to restrain corrupt men.

8. Examine any five of the following arguments, explaining the nature of the fallacy if any :—

(a) If language is the communication of information by signs, we must admit that the wagging. of a dog's tail is language.

(b) He who is most hungry eats most ; he who eats least is most hungry, and accordingly he who eats least, eats most.

(c) Had there been satisfactory proof of the prisoner's guilt, it would have been produced. No such evidence has been brought forward, so he must be innocent.

(d) A little knowledge is a dangerous thing ; hence I had better not attempt to learn logic.

(e) All civilised people are progressive ; all uncivilised people are superstitious ; therefore no superstitious people are progressive.

(*f*) Food which is not cooked is not wholesome. This food is not cooked, and is therefore not wholesome.

(*g*) Of University Professors some are keen on research, and some are good teachers. Professor X is keen on research, and we may therefore reasonably conclude that he is not a good teacher.

INDUCTIVE LOGIC.

Time—Three hours.

(*Only* SIX *questions are to be attempted, which must include question 8*).

1. Distinguish carefully between Deduction and Induction. Show how they are related to each other.

2. State and explain briefly the postulates of Inductive Inference.

3. What do you understand by Observation and Experiment ? Name and explain by examples some of the important errors incident to Observation.

4. (*a*) Explain the conditions of a valid hypothesis.

(*b*) Give, with examples, the meaning of (i) A Working Hypothesis, (ii) An Established Hypothesis and (iii) A Crucial Instance.

5. " If after much observation of B, we find that it agrees with A in nine out of ten of its known properties, we may conclude with a probability of nine to one that it will possess any given derivative property of A."—*Mill.*

" The force of an argument from Analogy depends upon the character of the identity, and not upon the apparent amount of similarity."—*Weston*.

Discuss the comparative validity of the above statements giving suitable examples.

6.   Discuss the value of Mill's method of agreement, and consider how far it is affected by the " plurality of causes " and " intermixture of effects."

7.   State and explain briefly the nature, the conditions and the value of Scientific Classification. How does Classifiction differ from Division ?

QUESTION PAPERS.

INTERMEDIATE EXAMINATION, 1924.

ENGLISH.

First Paper.

Either.

1.

(a) Give the main reasons why Socrates refused to escape from prison after his conviction.   10

Or,

(b) Describe briefly in your own words the Adventures of a Shilling.

Or,

(c) What was the state of Female Education in England in 1685 ?

Or,

(d) Describe briefly in your own words the episode of the Horseman who rode from the West.

2. Explain, with reference to the context, the meaning of any *four* of the following :—   20

(i) Histories make men wise, poets witty, the mathematics subtle,

natural philosophy deep, moral
grave, logic and rhetoric   able
to contend.

(ii). The wisdom of the   ignorant some-
what resembles the instinct of
animals ; it is diffused in but a
very narrow sphere, but within
that circle if acts with vigour,
uniformity, and success.

(iii) The great majority of the functiona-
ries   whose business   was to
administer justice and preserve
order either gave their services
to   the   public   gratuitously,
or   were remunerated in   a
manner which caused no drain
on the revenue of the state.

(iv) That these suspicions were not with-
out foundation, is proved by the
dying speeches of some penitent
. robbers of that age, who appear
to have received from the inn-
keepers services much resem-
bling   those which Faquhar's
Boniface rendered to Gibbet.

(v) " A king's crawl-boat," said Captain
Margatroyd with a sneer. " We
cannot hang the gauger. until
Venables brings up the *Fairy*

> *Queen*, for after all it was one of
> his hands that was snackled.''

3.   Answer the questions on *one* only of
the following passages *either* (*a*) or (*b*) :—   12

(*a*) At the close of the reign of Charles
the Second the pride of the Londoners *was*
smarting from   a   cruel   mortification. The
old charter had been taken away ; and the
magistracy had been remodelled. All the civic
functionaries were Tories ; and the Whigs,
though in numbers and in wealth*superior to
their opponents, found themselves *excluded*
from every local dignity. Nevertheless, the
external splendour of the municipal govern-
ment was not diminished, nay was rather
increased by this change.   For, under the
administration of some Puritans who had
lately * borne rule, *the ancient fame of the*
city for good cheer had declined.

(1) Explain the passages in italics so
as to bring out their full meaning.

(2) Parse the words marked with an
asterisk.

(3) Give   the   meaning of ' charter,'
' municipal government ' and ' cheer.'

(*b*) The   conservative, looking   before
and * after, draws from each contemplation
the matter for content. Out of the age of gas
lamps he glances back slightingly   at *the*

mirk and glimmer in which his ancestors wandered;
his heart waxes jocund at the contrast ; nor
do his lips *refrain from a stave, in the highest style
of poetry,* *lauding progress and the golden
mean. When gas first spread along a city,
mapping it forth about evenfall for the eye
of observant birds, a new age had begun for
sociality   and   corporate   pleasure-seeking,
and * begun with proper circumstance,
becoming its own birthright. *The work
of Prometheus had   advanced by another
stride.*

(1) Explain the passages in italics so
as to bring out their full meaning.

(2) Parse the words   marked   by   an
asterisk.

(3) Give the meaning of ‘ conservative,’
‘ stave ’ and ‘ birthright.’

4. Give   a   clause analysis of the
following   passage :—   8

When my sons grow up, visit them
with punishment, my friends, and vex them
in the same way that I have vexed   you, if
they seem to you to care for   riches, or for
any other thing, before virtue : and if they
think that they are something, when they
are nothing at all, reproach them, as I have
reproached you, for not caring for what

they should, and for thinking that they
are great   men when in fact   they   are
worthless.

***

SECOND PAPER.

[N.B.—*Marks will be   deducted for errors
in English.*]

1.   Describe briefly what you consider to
be the finest Word-Picture in the Rime of
the Ancient Mariner.   5

Or,

How far does the poem Sohrab and
Rustam, realise your idea of Epic Poetry ?

2.   Explain,   with a short reference to
the   context, *any* *three* of the following
passages :—   6

      (a) " 'Tis well that such seditious words
               are sung
          Only by   priests and in the
          Latin tongue."

      (b) They moved in tracks of shining
             white.
          And when they reared, the elfish
             light
          Fell off in hoary flakes.

      (c) And all day long, and, when night
             comes, the lamp.
          Lights up his   studious forehead
          and thin hands.

In his high mountain cradle in
   Pamere,

A foil'd circuitous · wanderer   .   .

4. Explain, with a short reference to the   9
context and annotate *any three* of the follow-
ing passages : —

(a) And deep within the mountain's
      burning breast
   Enceladus the giant was at rest.

(b) Scarce could they hear or see their
      foes,
   Until at weapon-point they close.

(c) He reared him, a bright bay, with
      lofty crest,
   Dight with a saddle-cloth of broi-
      der'd green,
   Crusted with gold, and on the
      ground were work'd
   All beasts of chase, all beasts which
      hunters know.

(d) .   .   .   .   The barge with oar and
      sail
   Moved from the brink, like some
      full-breasted swan
   That, fluttering a wild carol ere her
      death
   Ruffles her pure cold plume and
      takes the flood with swarthy
      webs.

furtive business, speeding home with a paltry
booty of lame horses and *lean kine*, or dealing
death in *some moorland feud*. One after another
closed his obscure adventures in mid-air,
triced up to the royal gibbet or the Baron's
duletree. But the Elliots had one boast
which must appear legitimate. The males
were born outlaws and deadly brawlers,
though ever true to chief and clan ; and
according to the same tradition, the females
were all chaste and faithful. The power of
ancestry on the character is not limited to the
inheritance of cells, and my grandson (if he
is Scottish) will feel *a quickening emulation of
his ancestor's deeds*. And the women of the
Elliots, passionate and reckless, who in the
shine of the peat fire told these tales, had
cherished through life *a wild integrity of virtue*.

(*a*)From the preceding passage, shew,
in two sentences how the clan spirit has in-
fluenced the Scottish Borderers for evil and
for good.   .

(*b*) Explain clearly the expressions in
italics.   12

A

[*For those candidates whose Mother-Tongue is
English.*]

Write an essay, not exceeding three pages 10
of your answer-book on—

Arthurian Literature.

Or,

The chief obstacles to the Norman Conquest of the Eastern and Northern counties of England.

B.

Explain, with a short reference to context, and annotate *any four* of the following passages :—   10

(i) . . . . . King Leodogran
Groan'd for the Roman legions here again,
And Caesar's eagle.

(ii) . . . . . . Thro' the Cross
And those around it and the Crucified,
Down from the casement over Arthur, smote
Flame-colour, vert and azure, in three rays
One falling upon each of three fair queens.

(iii) Till with a wink his dream was changed, the haze
Descended, and the solid earth became
As nothing, but the king stood out in heaven
Crown'd.

(iv) In meads of May flowers
Mild Mary will meet him ;

Me, happier, the Valkyrs
Shall waft from the war deck,
Shall hail from the holmgang
Or helmet-strewn moorland.

(v) " England lost ? Sussex is not Eng-
land. Let the tanner try to cross the Wat-
ling Street and he will find out that he
has another stamp of Englishman to deal
with."

(vi) " Have mercy, mercy, lord king !
make not that fiend earl over us. Send him
to be earl over the imps in hell, or over the
wild Welsh who are worse still ; but not
over us, good lord king whom he hath polled
and peeled."

THIRD PAPER.

[N.B.— *Immediately above your written answer
name from which your translation is made.*]

1. Translate into English :—   25

(a) معمولی طریقے سے ماوری لوگوں (Maoris)
پر اُن کے سردار بڑی سختی سے حکومت کرتے ہیں
وہ لوگ محنتی - قاعدے کے پابند - صاف
ستھرے ہوتے ہیں - وہ سوبرے اُٹھتے ہیں اور
دن میں دو مرتبہ کھانا کھاتے ہیں اور ہر
مرتبہ کھلی ہوا میں کھاتے ہیں نشہ کی
چیزوں کو جانتے ہی نہیں - ہر شخص کے لئے

روز مرہ کام کا مقرر ہے ۔ کچھ لوگ مچھلیاں

مارتے ۔ جڑیں پھنسانے یا جنگلوں میں پھل

اور جڑیں جمع کرکے غذا مہیا کرتے ہیں ۔ پھل

گھر یا ناؤ بناتے ہیں یا ان کی مرمت کرتے

ہیں ۔ کچھ لکڑی کاٹتے ہیں ۔ باقی اوزار یا

ہتھیار بناتے ہیں اور مختلف طریقوں سے عام

لوگوں کی بھلائی کے کام میں شرکت کرتے ہیں ۔

عورتیں کھانا پکاتی ہیں اور کھانا لگانے کے

لئے ہری ٹہنیوں کی چھوٹی چھوٹی ٹوکریاں

بناتی ہیں لیکن جس ٹوکری میں ایک بار پکا

ہوا کھانا لگا دیا جاتا ہے وہ پھر کام میں نہیں

لائی جاتی وہ لوگ دیسی پودھا ان کے لباس بناتی

ہیں اور یہ سن کے لئے اتنا ہی کام کا

ہوتا ہے جتنا اور گرم ملکوں کے رہنے والوں کے

لئے ناویل ہوا کرتا ہے ۔ جسم کی ساخت کے

لحاظ سے یہ لوگ ایک خوبصورت قوم ہیں

اور شب و روز باہر کام کرنے اور مسلسل کسرت

کرنے کی وجہ سے ان کا جسم گٹھا ہوا ہوتا ہے

اور یہ لوگ بیماری جانتی ہی نہیں ۔

(b) دنیا کے کسی ملک میں ریلوں کے جاری

ہونے سے اتنا انقلاب نہیں ہوا ہے جتنا کہ

کناڈا میں ہوگیا ہے ۔ اس سے پہلے مشرقی

کناروں کے کچھ کم آباد ضلعوں کے علاوہ کناڈا

جهانتك كه انسان كا تعلق هے ايلو سفسن
عالم تها ليكن ريل كے بننے سے جو مشرق يا
مغرب مل گئے اور پرديسي اور بسنے والوں كے
لئے يہه سر زمين كهل گئي تو كناڈا اپني
تاريخ كے نئے دور ميں آگيا ۔ بهلي بري ريل
كو تيار هوئے نسبتا چند هي سال گذرنے پائے
تهے كه سنسان ميدان اور الگ تهلگ پہاڑيوں
كي وادي هرے بهرے آناج كے كهيت اور بهرے
پورے پهلوں كے باغ بن گئے اور هزاروں ميل
تك ريل كي سرك كے كنارے كاروباري قصبوں
اور دولتمند شهروں كي قطاريں قائم هوگئں
هيں ۔ سنہ ۱۹۰۸ء ميں صرف ايك هي ريل
تقريباً ايك كروڑ مسافروں كولے گئي تهي ۔

2. Write an essay covering not more than *six* pages of your answer-book on the following subject :   25

" Some notable benefactors of the human race, and their achievements."

THIRD PAPER.

N. B.—*Immediately above your written answer, name the vernacular from which your translation is made.*

1. Translate into English :—   25

(*a*) साधारण रीति से माओरी (Maoris) लोगों का शासन उनके सरदार बड़ी कठोरता से करते हैं । यह

लोग परिश्रमी, नियमित स्वभाव वाले और साफ सुथरे होते हैं । यह सवेरे उठते और दिन में दोही वार भोजन करते हैं और प्रत्येक वार खुली हवा में खाते हैं । मादक वस्तु जानते ही नहीं । प्रत्येक मनुष्य का दैनिक कर्त्तव्य नियत है । कुछ लोग मछली मार के, चिड़ियाँ फँसा के, या वनों में फल-मूल इकट्ठा करके भोजन संग्रह करते हैं । कुछ घर या नाव बनाते या उनकी मरम्मत करते हैं ; कुछ लकड़ी काटते, वाड़ी या राछ या हथियार बनाते और अनेक रीति से साधारण के हितसाधन में सहयोग करते हैं । स्त्रियाँ भोजन बनातीं और भोजन परसने के लिये हरी टहनियों की छोटी छोटी टोकरियाँ बनाती हैं । परन्तु जिस टोकरी में एक वार पका हुआ खाना रखा जाता है वह फिर काम में नहीं लाई जाती । वह लोग देशी सन के कपड़े बनाते हैं । यह पौधा उनके इतना ही काम का है जितना गरम देश के रहने वालों के लिये नारियल । शरीर की बनावट में वह लोग सुन्दर जाति के हैं । और सदा वाहर काम करने और निरन्तर व्यायाम से उनका शरीर गठा हुआ रहता है और वह लोग रोग को जानते ही नहीं ।

(b) संसार के किसी देश में रेलों के जारी होने से इतना परिवर्त्तन नहीं हुआ जितना कि कैनाडा में हो गया है । इससे पहिले पूर्वी किनारों के कुछ कम वसे हुए ज़िलों को छोड़कर, कैनाडा, जहाँ तक मनुष्य जाति का सम्बन्ध

है, सुनसान जगत था । परन्तु रेल के बनने से जो पूर्व
और पश्चिम एक हो गये और परदेशी और बसने वालों
के लिये यह देश खुल गया तो कैनाडा के इतिहास का
नया युग प्रारम्भ हो गया है । पहिली बड़ी रेल के तैयार
होने पर कुछ ही बरस बीते थे कि सुनसान मैदानों और
अलग अलग पहाड़ों की घाटियों के हरे भरे नाज के खेत
और भरे पूरे फलों के बाग बन गये और हजारों मील तक
रेल की सड़क पर कारवारी कसबों और धनी नगरों की
पंक्ति बन गई । सन् १९०८ ई० में एक रेल अनुमान एक
करोड़ यात्री ले गई थी ।

2 Write an essay covering not more than 15
six pages of your answer-book on the follow-
ing subject :—

"Some notable benefactors of the human
race, and their achievements."

SANSKRIT.
FIRST PAPER.

1. Translate into English :—

अथ गलति मध्यरात्रे सर्वेरोपनीतमहाभरणपट्ट-
निवसनौ तदु विलग्नं प्रविश्य तूष्णीमतिष्ठाव । देवी तु
पूर्वेद्युरेव यथार्हमग्निसंस्कारं मालवाय दत्वा प्रचण्डवर्मणे
चण्डवर्मणे च तामवस्थामश्मकेन्द्रोपधिकृतामेव सन्दिश्य
उत्तरेद्युः प्रत्युपस्येच पूर्वसङ्केतितपौरामात्यमामन्त्यचुद्धैः

तन्मूलाश्च कलहाः सामर्षाणामुदभवन् । घ्नह्यन्त
दुर्बला वलिभिः । अपहतानि धनवतां धनानि तस्करा-
दिभिः । अपहतपरिभूतयः प्रहताश्च पातकपथाः । हतवा-
न्धवा हतावित्त वधबन्धातुराश्च । मुक्तकण्ठमाक्रोशन्तश्च
मुख्यः प्रजाः । दग्धश्चान्यथाप्रणीतो भयक्रोधावजनयत् ।
क्षताकुटुम्बेषु लोभः पदमधत्त । विमानिताश्च तेजस्विनो
मानेनादह्यन्त । तेषु तेषु चाकृत्येषु प्रासरन् परोपजापाः ।

4. (a) Change the voices in the underlined
expressions.

(b) Expound पातकपथाः and तन्मूलाः ।

(c) Account for the चतुर्थी in तृणाय न गणयित्वा
Can you use it in any other विभक्ति ।

(d) Decline युवन्, अनड्वह्, and सखि in द्वितीया,
चतुर्थी and सप्तमी विभक्ति's respectively.

(e) Conjugate श्रु in लुङ् 3rd pers. चर् in लिट्
2nd pers. and धा in लुङ् 1st pers.

SECOND PAPER.

1. Reproduce four stanzas from the song
of glory. (स्तुति) sung by the gods to Vishnu
and explain in English one of them that inci-
dentally involves an important theory of Nyaya
or Sankhya philosophy.

2. (i) दशाननकिरीटेभ्यस्तत्तनं रांत्तसश्रियः ।
मणिव्याजेन पर्यस्ताः पृथिव्यामश्रुविन्दवः ॥

I. E.—2

3. " काव्येषु नाटकं रम्यं नाटकेषु शकुन्तला ।
तत्रापि च चतुर्थोऽङ्कस्तत्र श्लोकचतुष्टयम् ॥"

Do you notice any grammatical inaccu-   1
racy in the above ?

Justify this popular remark with refer-   4
ence to your prescribed portion and repro-
duce the four stanzas referred to.

4. यात्येकतोऽस्तशिखरं पतिरोषधीना-
माविष्कृतोऽरुणपरस्पर एकतोऽर्कः ।
तेजोद्वयस्य युगपद्व्यसनोदयाभ्यां
लोको नियम्यत इवात्मदशान्तरेषु ॥

(a) Explain the above in Sanskrit.   2

(b) What is the significance of पतिरोषधीनाम् ?   1

(c) Explain the rule of Sandhi in लोको निय-
म्यत इव ।   1

(d) Name the metre and the figures of   2
speech employed in the above stanza.

5. Convert the following into Sanskrit :—   4

पडिबुद्धा वि किं करिस्सं । एमे उद्देसेसु वि णिब्भ-
करणिञ्जेसु हत्थपाया पसरन्ति । कामो दाणि सकामो
होदु जेण घरसञ्चसंधे जणे सुणहिअम्हा सही पदं कारिदा ।
ग्रह वा दुव्वाससो कोवो एसो विञ्चारेदि । ग्रणहा कहं
सो राप्पसी तारिसाणि मन्तिभ पत्तिग्रस्स कालस्स
लेहमेत्तं पिण विसञ्जेदि । ता इदो ग्रहिसमाग्रां ग्रङ्गूलग्रं
सो विसञ्जेम । दुक्खसीले तवस्सिजणे को ग्रभत्थीग्रदु ।

PERSIAN.

FIRST PAPER.

1. Translate into English :

(a) آورده اند که درویشی در بیشهٔ میگذشت
و در آثار رحمت و اطوار قدرت اندیشه می
فرمود ۔ ناگاه شاهبازی تیز پر دید قدری گوشت
در چنگال گرفته گرد درختی پرواز می کرد و
باهتراز تمام بر حوالي آشیانهٔ طوف می فرمود ۔
مرد ازین معنی متعجب شده زمانی به نظاره
بایستاد ۔ کلاغ بی بال و پر دید دران آشیانه
افتاده و آن باز پاره پاره گوشت جدا می کرد و
بقدرحوصلهٔ کلاغ بی بال و پر در دهنش می
نهاد ۔ مرد گفت سبحان الله عنایت الهی و
رحمت نامتناهی نگر که کلاغی بی بال وپر را که
نه قوت طیران دارد و نه شرکت جولان در
گوشهٔ این آشیانه بی روزی نمیگزارد ۔

(b) بعد از جلوس اولین حکم که صادر
شد بستن زنجیر عذل بود که اگر متصدیان
مهمات دارالعدالت در داد خواهی وغور رسی
ستم رسیدگان و مظلومان اهمال و مداهنت
ورزند آن مظلومان خود را بدین زنجیر رسانیده
سلسله جنبان گردند تا صدا اے آن باعث

7

آگاهي گردد و دوازده حكم فرمودند كه در جميع
ممالك محروسه معمول داشته اين احكام را
دستورالعمل سازند اول منع زكوة از تمغا و مير
بكري دوم در ممالك محروسه از مسلمان و نا
مسلمان هركسي كه فوت شود مال و منال را
بورثه واگذارند و هيچكس دران مدخل نسازد
واگر وارث نداشته باشد بنجهت آن اموال مشرف
و تحويلدار علحده تعين نمايند وغيره وغيره ۔

2. Describe *one* of the following in your
own Persian :— 8

    (i) The religious ideas of Akbar as de-
        rived from his sayings.

    (ii) The peculiarities of modern Persian
        prose as understood from the
        Safar Namah of Nasir-ud-din
        Shah.

3. Explain in English or Persian with
    reference to allusions :—

8   (a) در ازل پرتو حسنت ز تجلي دم زد
عشق پيدا شد و آتش بهمه عالم زد
عقل ميخواست كزان شعله چراغ افروزد
برق غيرت بدرخشيد و جهان برهم زد
ديگران قرعهٔ قسمت همه بر عيش زدند
دل غمديدهٔ مابود كه هم بر غم زد

نظمي كرد كه بيند بجهان صورت خويش

خيمه در آب و گل مزرعهٔ آدم زد

7 (b) چون بر فلك طليعهٔ شب گشت آشكار

عالم نسود كسوت عباسيان شعار

روي فلك چو لجهٔ دريا و ماه نو

مانند كشتي كه ز دريا كند گذار

يا بر مثال ماهي يونس ميان آب

آهنگ در كشيدن او كرده ازكنار

يا همچو يونس آمده بيرون ز بطن حوت

افتاده بر كرانهٔ دريا نحيف و زار

4. (a) Analyse :—

ايدل شباب رفت و سنجيدي گلي ز عمر

پيرانه سر ممكن هوس تنگ و نام را

(b) Give the Plurals of the overlined 2
     words in Q. 3 (b).

(c) Give the meanings of various كه's in
     Q. 1 (b).   2

SECOND PAPER.

Translate into English :—

A.

15   ملك علاءالدين علاءالسلطنت زمين
خدمت بوسيده گفت ستكن دين و شريعت

تعلق بانبيا صلواة اللہ عليهم داره و نبوت
ايشان وابستہ بوحي آن امر بحضرت رسالت
پناہ محمدي صلي اللہ عليہ و سلم ختم
شدہ است امکان نہ دارد کہ خاص و عام و خود
و بزرگ و نزديك و دور بريں امر مطلع شدہ از
خداوند جهاں متنفر نہ گردند و خلل و فساد
عظيم بهم نرسد - سزاوار دولت انست کہ رقم
ايں انديشہ ازلوح خاطر همايوں بکزلك
فکر و خود جك سازند و پيرامون ايں امر خطير
نگردند کہ ميسر و مقدور بشر نيست چرا کہ
چنگيز خاں و اولاد او سالهاي غراوان کوشش
بليغ نمودند کہ دين محمدي بر طرف گردہ و
ديں خود را کہ چنديں هزار سال در ترکستان
رواج داشت در عالم شائع گرداننند اما بهيچ
وجهہ ميسر نشد و عاقبت الامر استواري ديں
متيں محمدى بخاطر آوردہ احفاد ايشان
مسلمان شدند -   - بيت -

بہ نزد من انکس نکو خواہ تست
کہ گويد فلاں خار در راہ تست

B.

10   چوں هميوں کہ سپہ سالار و مدار عليہ
سلطان محمد عدلي بود با ابراهيم خاں سور

و با سلطان محمد حاکم بنگاله
که هر ایک دعوی پادشاهی و دیگر افاغنه
تسلط داشت محاربات نموده و بر بعضی از بلاد
اندک مدتی کار نامها بظهور ظفر یافت و در
استکبار بر افراشت ـ باستماع رسانیده لوای
همایون التزاع سلطنت از دست اکبر خبر ارتحال
او آسان شمرده عدلی را در پتنه گذاشته عازم
آگره و دهلی گردید ـ چون باگره رسید با
سکندر خان و قبا خان و دیگر امرای پادشاهی
مصاف بدلیری داده آگره را متصرف گشت و از
آنجا بیگ خان را مع دیگر امرای شاهی رسیده
تردی از پیش (روی خود برداشته گریزانید ﷽
دلاوری تمام در دهلی باندک
جنگی

Translate the following passages into
Persian :—

A.   8

Whilst his disciples were seeking safety
in other lands from the persecutions of their
enemies, he himself stood bravely at his post,
and amidst every insult and outrage pursued
his mission. Again they came to him with
promises of honour and riches, to seduce
him from his duty ; the reply was, as

before, full of life, full of faith : ". I am neither desirous of riches nor ambitious of dignity nor of dominion ; I care for my duty only.' If you accept the message I bring you, the King will favour you ; if you reject I shall be patient and the King will judge everything rightly." They mocked him and persecuted him, but his simple trust and sublime faith rose superior to all their materialistic scepticism.

B.

They relate that a fox entered a thicket. There he saw a drum cast down by the side of a tree, and whenever the wind stirred, the branches of the tree struck the drum and a terrific noise assailed the fox's ears. When the fox saw the bulkiness of the drum and heard the majesty of its voice he greedily imagined that its flesh and skin would prove worthy of its voice. He strove until he had rent it asunder. In fact he found nothing more than skin. Remorsefully he said, " I did not realize that wherever there is the greater bulk and the more terrible noise, there is the less profit."

DEDUCTIVE LOGIC.

Answer six *questions of which No. 8 must be one.*

1. What is a Term ? How are Terms classified ?　7

Explain and illustrate the following statement :—

If the connotation of a term is increased or decreased ; the denotation will change in the opposite direction.

2. Define Logical Division and distinguish it from the processes with which it is liable to be confounded.　7

Examine the following Divisions :—
   (i) Indians into rich, poor, consumptive, and educated.
  (ii) Triangles into equiangular, isosceles, and scalene.
 (iii) Great Britain into England, Scotland, Ireland and India.

3. Reduce the following sentences to the strict logical form and say what terms, if any, are distributed in each :—　7

   (i) None but logicians see any difficulty in the matter.
  (ii) All good men are not necessarily happy, nor are all happy men necessarily good.

(iii) Graduates alone are eligible for the post.

(iv) There is nothing that disgusts a man so much as failure after boasting.

(v) Few men in the College are good sportsmen.

4. Transform the following propositions 7 in such a way that they may have S as subject and P as predicate :—

(i) No non-P is S.

(ii) All P is non-S.

(iii) Some non-P is not non-S.

Name the processes involved in the transformation and verify your results by means of Euler's Circles.

5. Show that :

(a) If the Middle Term is distributed twice in the premises, the conclusion is particular.

(b) If a Mood has a particular affirmative for its Major Premise, and a universal negative for its Minor Premise, it is invalid.

6. Define and illustrate the following forms of the Syllogism :—

[i] Disjunctive Syllogism, [ii] Pure Hypothetical Syllogism, [iii] Constructive Dilemma, [iv] Progressive Sorites, [v] Epicheirema.

7. Explain the nature of Reduction. 7
Reduce the following Moods to the First
Figure :—

(i) All honest men are reliable.
Some intelligent men are not reliable, ;
Therefore, some intelligent men are not
honest.

(ii) Some Councillors are well educated.
All Councillors are men of influence.
Therefore, some men of influence are well
educated.

One of the moods should be reduced
Indirectly.

8. Examine any *five* of the following
arguments :—

(a) The Intermediate Board has taken 3.
over the control of the Intermediate Exam-
ination. This shows that the University
of Allahabad was not conducting the Exam-
ination properly.

(b) A man of genius is generally eccentric ; 3.
you are eccentric ; therefore, you are a man
of genius.

(c) A man who is inaculated becomes 5.
immune from plague ; I am not inaculated ;
therefore, I am not immune from plague.

(d) If James is fated to die, no doctors 3.
can save him ; if he is fated to recover, no

doctors are needed ; why then waste money
on doctors ?

(*e*) Our critics tell us that we are support-   3
ing uneducated candidates for the Municipal
Board election.   Every one of the men in
question is managing his business of lakhs
of rupees.   Why cannot they manage Muni-
cipal affairs ?

(*f*) Under particular circumstances politi-   3
cal revolutions are necessary for the welfare
of a country ; in China, political revolutions
are frequent ; therefore China is making
rapid progress.

(*g*) My brother and my cousin passed the   3
examination in the first division ; therefore I
have every chance of passing the examina-
tion in the first division.

INDUCTIVE LOGIC.

[Only six questions to be answered of which
No. 9 must be one.]

1.   What do you understand by the Law   7
of Causation and the Uniformity of Nature ?
How are the two related ?

2.   What is a Hypothesis ?   Give some   7
account of different kinds of hypotheses.

3.   What are the conditions of a good   7
argument from Analogy ?

4. How are observation and experiment   7
related to each other? Bring out their
importance in Induction.

5. Several large towns in the north of   7
England are engaged in textile (cotton and
woollen goods, for example) manufacture and
in these same towns infant mortality is very
high. *A*, *B*, *C*, and *D*, are textile manufactur-
ing towns and must therefore have high in-
fantile mortality.

What kind of argument is this, and
what deductive fallacy would be committed
if the universal conclusion " All   textile
manufacturing towns have high infant
mortality " were drawn from the facts given
above?

6. " Induction is the process of inference   7
from particular to particular, while Deduc-
tion is inference from general to particular.".
Discuss this statement and explain what you
consider to be the relation between Induction
and Deduction.

7. Discuss briefly Mill's " Inductive   9
Methods," and distinguish the " methods of
observation " from the methods of experi-
mentation." Illustrate your answer by
means of examples.

8. Explain fully what logical methods
would be of greatest value in determining—

(1) The cause of plague.

    (2) The effects of the retail sale of intoxicating liquor.

    (3) The prosperity or decline of a College.   7

9. Analyse any *three* of the following 15 arguments, discussing their validity, and indicating the method used :—

    (*a*) The principal cause of the awakening in the country is the spread of Western ideas through the Western system of education. The awakening is more conspicuous in British India than it is in the Native State ; and in British India itself provinces that have imbibed the spirit of Western enducation more are more progressive than others. Looking to the development of political consciousness in the country as a whole, we find it has run parallel to the development of Western education.

    (*b*) Do games influence the character of young men ? The Principal of a College insisted that every student must spend some time every day in the play-ground. In the course of a few months a distinct change in the tone of the College was observed. The students were more manly, straight-forward, and honest than before. The principal left the College and was succeeded by another who had more faith in reading books. Not long after any one could see that, though

the students of the College did better in the examinations, they had distinctly deteriorated in character.

(c) On a board where a number of ants were wandering about, I put some small pieces of wood, and on these pieces of wood I put some honey. I then put some ants to the honey and imprisoned them. While these ants were imprisoned very few ants came to the honey. But after the imprisoned ants were released, within three quarters of an hour 54 ants came. The conclusion seems to be that ants can communicate with each other.

(d) A community consists of individuals, and individual consists of cells. Both of them are complex structures. The individual grows and so does the community. The community thrives when members co-operate with one another, and the health of the individual is dependent on the organs working in harmony. There being such close resemblance between the individual and the community, it is obvious that the community, like the individual, is mortal.

(e) In India it has been noticed that as soon as the hot weather begins epidemics often take place and we have either cholera or small-pox or fever. It is clear therefore that the hot weather brings disease; but it is also true that plague is worst during the

cold weather. Are we to say, therefore, that cold also causes an epidemic?

HISTORY—MODERN (EUROPEAN)

FIRST PAPER.

Only six questions should be attempted ; at least two should be answered from each section.

Question No. 6 is compulsory.

A.

1. What do you understand by the Reformation? Explain its causes and describe its course to the Peace of Augsburg.   8

2. Narrate the story of the war of liberation in the Netherlands.   8

3. "The peace of Westphalia is the first great European treaty which settled what a great war had unsettled." Explain.   8

4. It is said of Louis XIV that 'he built his throne on the ruin of all classes." How far is the statement true? What were the permanent gains of France from his rule?

5. How was the Industrial Revolution brought about? What changes did it produce in Europe?   8

6. Draw a map of Europe showing its political divisions in 1815.   10

B.

7. Discuss the causes of the discontent of the people during the Stuart period.

8. What part did England play in the   8
Napoleonic wars ? And what did it gain by
his fall ?

9. Describe the origin, the development   8
and the functions of the Cabinet.

10. " The story of Australia in the nine-   8
teenth century is a story of wonderful pro-
gress." Explain.

11. What is the meaning of Responsible   8
Government ? How did Canada obtain
responsible government ?

12. Describe the sea-routes which link   8
the British Empire. How are they guarded ?

MODERN HISTORY, II (a) ENGLISH HISTORY.
SECOND PAPER.

Only five *questions to be attempted,* three *from Section A, and* two *from Section B. :*

A.

1. What were the effects of the Roman   10
occupation on Britain ?

2. The Great Charter (1215) has been   10
described as " a landmark in English
History." Mention its chief provisions and
justify the observation.

3. Describe the career of Cromwell, and   10
estimate his achievements.

4. Describe the origin of the political 10 parties in England and their growth till 1720.

5. Describe the part played by England 10 in the Seven Years' War.

6. Write short notes on any *four* of the following :—Scutage, the Assize of Arms, Rotten Boroughs, the Petition of Right, Orders in Council, The Test Act, The Agreement of the People.

7. Draw a map of North America, show- 10 ing the British colonies in 1776. Give the date of acquisition of each.

B.

8. Contrast the system of medieval 10 commerce with that of the modern.

9. Discuss fully the advantages and the 10 disadvantages of the policy of the national minimum.

10. What were the causes of the poverty 10 and misery of the workers in the first half of the 19th century ?

11. Give an account of the social and 10 economic conditions of England in the time of Elizabeth.

12. Write short notes on *three* of the 10 following :—

(a) Utopia; (b) Pilgrimage of grace, (c) Free trade, (d) Joint-stock Company, (e) Socialism; (f) Old age pensions.

Or,

II (b) Indian History.

*Attempt any six questions.   Question No. 5
is compulsory.*

1. Trace the stages in the conquest of 8
Hindustan by Babar. Illustrate your answer
with a map.

2. Account for the downfall of the Sur 8
dynasty.

3. Describe briefly the relations of Akbar 8
with the kingdoms of the Deccan. How did
his conquests influence the policy of his
successors in the Deccan ?

4. India attained the zenith of its pros- 8
perity in the reign of Shabjahan. Discuss
the statement.

5. Describe the career of Peshwa Baji 10
Rao (1720-40). Give a map on the Maratha
empire in 1740.

6. Narrate briefly the history of the 8
Sikhs from the death of Guru Govind Singh
to the death of Maharaja Ranjit Singh.

7. Give an account of the events leading 8
to the battle of Buxar, with special reference
to the policy and character of Mir Qasim.

8. State fully the circumstances under 8
which Wallesley introduced his system of
subsidiary alliances.

9. Give a brief account of the relation of 8
the East India Company with Oudh from
1801 to 1856.

10. In what relationship did the Govern-
ment of India stand with the countries of
Afghanistan and Persia before the Great
War? How has the relationship changed
recently?

11. Give an account of the viceroyalty 8
of Lord Curzon.

12. Trace the development of the consti- 8
tution and powers of the Indian legislatures
from 1892.

ANCIENT HISTORY.

First Paper.

Answer any five questions.

1. Describe the settlement of the Ionians 10
on the coast of Asia Minor. Illustrate your
answer with a map.

2. Examine and criticise the Spartan 10
constitution.

3. What is your estimate of Cimon, son 10
of Miltiades?

4. Trace clearly the steps by which the 10
Delian League developed into an Athenian
Empire. Draw a map to show the geographi-
cal position of the members of the League.

5. Sketch the career of Alcibiades. 10

6.   What is the significance of Cyrus' 10
adventure against Artaxerxes ?   Illustrate
his line of advance by a map.

7.   Account for the comparatively small 10
part played by Thessaly in Greek history.

8.   Trace briefly the development of mili- 10
tary and naval arts among the Greeks down
to 362 B. C.

9.   Compare the ideas of ancient Greece 10
with those of modern Europe on (a) Demo-
cracy, (b) Colonisation.

10.   Give a description of life in Athens 10
in the age of Pericles.

SECOND PAPER.

Answer five *questions only.*

1.   Sketch the history of the struggle 10
between the plebeians and the particians
during the first two centuries of the republic.

2.   Trace the successive stages in the 10
Roman conquest of Italy. Illustrate your
answer with a sketch map.

3.   Give some account of Roman naval 10
operations in the first Punic War. What use
did Rome make of her sea power in the years
immediately following upon peace ?

4.   In what circumstances did Greece 10
become a Roman province ?   Estimate the
effect upon Roman life and character of con-
tact with Greece and the East.

5.   Discuss the causes and the results of   10
the Social War of 91—88 B.C.

6.   State what you know of the character,   10
aims and career of Gaius Marius.

7.   Describe the part played by Cicero in   10
the history of his time.

8.   Give your estimate of Caesar's states-   10
manship with special reference to (*a*) his
treatment of conquered Gaul, and (*b*) his
reforms of 45-44 B.C.

9.   Describe the principal changes made   10
by Augustus in the working of the constitu-
tion.

10.   Draw a map to illustrate the extent   10
of Alexander's empire at the time of his
death.

MATHEMATICS.
FIRST PAPER.

Questions 1 and 5, and five others to be answered.

1.   If a and B are the roots of the equation   4

$$x^2 + x + 1 = 0$$

form the equation whose roots are a^2
and B^2.

Find the value of $a^3 - B^3$.

2.   Solve the equations—

$$x + y + z = 0$$
$$x^2 + y^2 + z^2 = 14$$
$$x^3 + y^3 + z^3 = -18$$

3. Sum the following series—   5

(i) $1+3+6+10+15+\ldots\ldots$ to 20 terms.

(ii) $1+2x+3x^2+4x^3+\ldots\ldots$ to infinity.

where x is a proper fraction.

4. Prove the Binomial theorem for a   5
positive integral index.

Find the *9th* term in the expansion of

$$\left(1+\frac{2}{3\frac{1}{2}}\right)^{-2}.$$

5. Prove geometrically that

$\cos(A-B)=\cos A \cos B+\sin A \sin B.$

Deduce the formula for $\cos(A+B)$.

6. Solve the equation completely :—   5

$\tan 30+\tan+20+\tan 0=0.$

7. Establish for a triangle the following   5
identities

(i) $\dfrac{\sin A}{a}=\dfrac{\sin B}{b}=\dfrac{\sin C}{c}=\dfrac{1}{2R}.$

(ii) $\sin A+\sin B+\sin C=4\cos\dfrac{A}{2}\cos\dfrac{B}{2}\cos\dfrac{C}{2}$

8. If r, R be the radii of the inscribed   5
and circumscribed circles of a triangle and
r_1, r_2, r_3 be the radii of the escribed circles,
prove that

$$(r^1-r)(r^2-r)(r^3-r)=4Rr^2.$$

SECOND PAPER.

*Questions 2 and 5, and any five of the
remaining seven are to be answered.*

1. Prove that the volume of a frustum   5
of a cone is

$$\frac{h}{3}(A + \sqrt{\overline{AB}} + B),$$

where h is the height of the frustum, A and
B the areas of the two ends. Calculate the
volume to the nearest cubic inch, when

$h = 4\cdot5''$, $A = 28\cdot5$ sq. in., $B = 78\cdot6$ sq. in.

What does the formula become [i] when $A =$
B, [ii] when $A = 0$? Give the geometrical
interpretation in each case.

2. A cylinder is circumscribed about a   4
hemisphere (*i.e.* the height of the cylinder and
the radius of its base are each equal to the
radius of the hemisphere); a cone is inscribed
in the cylinder so as to have its vertex at the
centre of one end, and the other end as base;
shew that

$$\frac{\text{vol. of cylinder}}{3} = \frac{\text{vol. of hemisphere}}{2} = \frac{\text{vol of cone.}}{1}$$

3. Shew that the four lines which join   5
the vertices of a tetrahedron to the centroids
of the opposite faces meet at a point which
divides them in the ratio 3 : 1.

Prove that the shortest distances between two opposite edges of a regular tetrahedron is one half of the diagonal of the square on an edge.

4. Find the co-ordinates of the point   5 which divides in a given ratio ($m_1 : m_2$) the line joining two (x_1, y_2) and (x_2, y_2).

Prove that in any triangle ABC.

$$AB_2 + AC_2 = 2(AD_2 + DC_2)$$

where D is the middle point of BC.

5. Find the area of a triangle whose   4 angular points are given in a polar co-ordinates.

Find the area of the triangle the polar co-ordinates of whose angular points are

$$(1, 0), \left(1, \frac{\overline{11}}{2}\right), \text{ and } \left(\sqrt{2}, \frac{\overline{11}}{4}\right)$$

respectively.   5

6. Shew that the straight line.

$$y = mx + \frac{a}{m}$$

is a tangent to the parabola $y^2 = 4ax$.

Hence, or otherwise, prove that the orthocentre of any triangle formed by three tangents to a parobola lies on the directrix.

7. If the normal at any point P of an   5 ellipse with centre C and foci S, S' meets the

major and minor axes in G and g, and if CF be the perpendicular upon this normal, then prove that

$PF. PG = b^2$, $PF. Pg = a^2$, and $PG. Pg = SP. S'P$; where a is the semi-axis major and b the semi-axis minor.

8. Define a rectangular hyperbola, and find its eccentricity. If a circle and a rectangular hyperbola meet in four points, prove that the centre of mean position of the four points bisects the distance between the centres of the two curves.

9. Find the condition that the equation 5

$$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$$
may represent two straight lines.

For what values of y does the equation

$$12x^2 + yxy + 2y^2 + 11x - 5y + 2 = 0$$
represent two straight lines ?

THIRD PAPER.

Question 1 and 8 and four others to be answered.

1. Enunciate the proposition known as 5 the "Triangle of Forces."

A light rod AB is suspended by two unequal strings OA, OB from a point O and at A, B equal weights, W. are hung. If the angle AOB is a right angle prove that the thrust in the rod is W and that the tensions

in the strings are proportional to the lengths of the strings.

2. What conclusion do you draw in each 6. of the three following cases of the vanishing of the moment of a force [1] about a point, [2] about each of two points coplanar with the force, [3] about each of three points coplanar with the force ? Give reasons for your conclusions.

ABC is a right-angled triangle, the angle A being right and the sides a, b, c being 5, 4, 3 units of length respectively ; the moments of a force F about A, B, C are 0, 16 and -9 units of moment respectively ; find the magnitude and direction of F.

3. Find the centre of gravity of three 6. rods of the uniform cross-section and density but of unequal lengths which are joined at their ends to form a triangle.

A uniform bar, of length 30 feet and of weight 15lb., is bent into the form of a triangle of side 5, 12, 13 feet respectively, and rests on a rough horizontal table. Find the least force which, applied at a corner, is on the point of raising that corner from the table.

4. Describe the common balance. What properties are desirable in a good balance and how may these properties be secured ?

5. What is the " angle of friction ?

A rough plane is inclined to the horizontal at an angle less than the angle of friction. In what direction should the minimum force necessary to drag a heavy body *down* the plane be applied ?

If the inclination of the plane to the horizontal at 15°, the angle of friction be 45° and the weight of the body 10lb., find the least force required to drag the body *down* the plane.

6. Define " relative velacity " and explain how the velocity of a moving point, B relative to a moving point A may be found.   6

Two roads cross at an angle of 60°. Two persons, one of each road walking at the same speed, are approaching the crossing (acute angle), their simultaneous distance from the crossing being 100 yards, and 200 yards respectively. Find their distances from the crossing at the instant when they are nearest to one another.

7. Distinguish between the two forms of energy. What units are used to express the measure of each form ?   6

A train of 200 tons weight can be drawn by an engine working at the rate o 360 horse-power at a uniform speed of 30 miles an hour up an incline of 1 in 200 Calculate the frictional resistance in pounds weight per ton.

8. A body is projected from a point in a   5
given direction with a given velocity and is
subject to gravity. Give a construction to
find its position at any instant.

An aeroplane is moving horizontally
at 60 miles per hour at a height of 400 feet
above the earth when a bomb is dropped
from it; find where the bomb will strike the
earth [1] relative to the position of the aero-
plane at the instant of dropping, [2] relative
to the position of the aeroplane at the instant
the bomb strikes the earth.

9. What is meant by "co-efficient of
restitution"? Three balls, of masses 30
grammes, 20 grammes and 7 grammes re-
spectively, lie in a straight line on a smooth
horizontal table; the two smaller balls are
initially at rest. The first ball impinges
directly on the second which thereafter strikes
the third ball. It is found that the third
ball moves off with a velocity equal to the
initial velocity of the first ball. Find the
co-efficient of restitution between the balls.

PHYSICS.

FIRST PAPER.

N.B.—*Only* **eight** *questions to be attempted.*
The questions are of equal value (5 marks.)

1. Explain how the thermal expansion of
air may be utilised for measuring temperature.

2. Describe any method of determining the Mechanical Equivalent of heat.

3. The following meteorological observations were recorded at Lucknow :—

Maximum temperature (in shade) of past 24 hours, 95·5.

Minimum temperature (in shade) of past 24 hours, 78·2.

Humidity.   95.

Explain what you understand by the numbers given above, and describe a method for measuring each of them. What inference do you draw from the above figures regarding the season of the year during which those observations were taken ?

4. Account for the difference between the specific heat of a gas at constant volume and that at constant pressure. Describe a method for measuring one of them.

5. What is meant by the " apparent co-efficient of expansion of a liquid " ? How will you proceed to determine the apparent co-efficient with the help of the Weight Thermometer ?

6. What do you understand by Parallax ? Describe how you will use the method of Parallax to determine the focal length of a convex lens ; being given a pin, a plane mirror, and a scale.

7. You are given a block of glass, a piece. of paper with a pencil mark, some lycopodium powder, and a microscope capable of vertical motion along a scale. Explain clearly how you would find out the refractive index of glass.

8. Describe a method for determining the velocity of light.

9. Describe the Bunsen Grease Spot Photometes and explain its action.

It was found in an experiment that a lamp with a dirty chimney when placed at a distance of 10 cm. from the grease spot balanced a candle. On cleaning the chimney it was found that the lamp had to be moved 2 cm. nearer for balancing the same candle, which was not moved during the experiment.

Calculate the percentage of light which was being absorbed by the dirty chimney.

10. Describe the Spectrometer and explain clearly the function of the Collimator. How will you use this instrument to determine the angle of a prism?

11. Describe, with diagram, any form of astronomical telescope.

SECOND PAPER.

Not more than eight questions to be attempted.
All questions are of equal value (5 marks.)

1. What effect is produced on the frequency and quality of the note given by an open organ

I. E.—4

pipe if the top is suddenly closed ?   If the frequencies of the first overtones of the two notes so obtained differ by 440, what was the original frequency ?

 2.   What do you understand by *pitch* and *intensity* of sound ?   How would you determine the pitch of a tuning fork with a Sonometer.

 3.   How would you determine experimentally the velocity of sound (*a*) air, (*b*) a solid ?

4.   What is magnetic induction ?   A magnet is placed horizontally in the magnetic meridian due south of a compass needle.   How will its action of the latter be affected if (*a*) a thick plate of quite soft iron be interposed vertically between the two and (*b*) a rod of soft iron be placed along the line joining the two.

5.   What reasons are there for stating that the earth in magnetised ?   State what you know of the distribution of this magnetism.

6.   Describe some form of electrical condenser.   Explain what is meant by the capacity of a condenser and point out the factors on which it depends.

7.   Describe carefully the construction of an electrophorus and indicate the source of electrical energy produced.

8.   A copper wire and an iron wire are connected to an accumulator, first in series and then in parallel.   In the first case, the iron wire gets red hot and in the second case the copper

wire. Explain these facts and show how to compare the resistances from the rates at which the heat is developed in each case.

9. What is an Ammeter ? How it is it used ? How does it differ from a Voltmeter ?

10. Describe the construction and explain the action of an induction coil.

11. Describe the construction and action of either a Telephone or of an Electric Bell.

CHEMISTRY.

FIRT PAPER.

1. (a) What is the rule expressing the relationship between the vapour density of a substance and its molecular weight ? If you are aware of any limitations or exceptions to the rule, mention them and account for them.

(b) In an experiment with Victor Meyer's vapour density apparatus, 0·15 gram of a liquid was volatilised. The air displaced and collected in the tube was found to be 26 c. c., the water inside standing 27 cms. above the level of the water in the trough. The atmospheric pressure was 755 mm. and the temperature 26°C. Calculate the vapour density of the substance. Tension of aqueous vapour at 26°C=25 mm. Specific gravity of mercury=13·5.

2. (a) How would you demonstrate the   6
presence of carbon in carbon dioxide, and of
sulphur in sulphuretted hydrogen ?

(b) Potassium iodide is liable to con-
tain potassium carbonate and calomel
(mercurous chloride) is liable to contain
corrosive sublimate (mercuric chloride).
How do you account for the presence of
these impurities and how would you test for
their presence ?

3.   Describe the ordinary method for the   6
manufacture of glass.   Give the consti-
tuents and the properties of the commoner
varieties of glass.   How are colours intro-
duced in glass ?

4.   What bodies are produced when   5
caustic potash acts upon the following sub-
stances individually :—phosphorous, zinc,
chlorine, and carbon dioxide ? Give equa-
tions and the conditions necessary for the
action to take place.

5.   How could you distinguish an acid   6
from an ester both of which had the same
molecular formula $C_4H_8O_2$? How would
you proceed to determine the nature of the
acid and alcohol combined in an ester of the
above formula ?

6.   By what reactions would you obtain   5
the following derivatives from acetic acid :—
acetyl chloride, acetamide, ethyl acetate,
acetic anhydride, and monochloracic acid ?

7. *(a)* A substance is known to contain   6
a ketone mixed up with impurities. How
would you proceed to isolate it in a pure
form ?

(b) How would you convert sodium
carbonate into sodium sulphite, carbon
dioxide into carbon monoxide, and iodine
into iodic acid ?

SECOND PAPER.

*Equations and diagrams should be given
throughout.*

1. Describe the preparation and proper-   5
ties of potassium hydroxide.

2. Compare the carbonates of sodium,   5
potassium, calcium, barium, zinc and magne-
sium.

3. Calculate the weight of copper and   5
the volume of nitric acid required for the
preparation of five litres of nitric oxide mea-
sured at 20°C, and 755 mm., assuming that
no side reactions take place. The nitric acid
supplied has a density of 1·42 and contains
61% by weight of real nitric acid. (Cu. 63 ;
N, 14.)

4. Describe the preparation of lead acetate   5
and from it the preparation of the chloride
and sulphate. State the chief properties of
these three salts.

5. In what respects do the compounds   5
of antimony differ from those of arsenic ?

6. State fully the properties of the oxides, chlorides and sulphides of mercury.　5

7. Compare the properties of the oxides of carbon and show how each can be converted into the other.　3

8. What is the action of water on the following : acetic anhydride, acetamide, acetyl chloride, ethyl acetate, glacial acetic acid ?　3

9. Write the constitutional (or graphic) formulæ of—　4

　　(a) two *homologues* of acetic acid ;

　　(b) two *derivatives* of propane ;

　　(c) the *parent hydrocarbons* of iodoform and of acetamide ;

　　(d) two *isomers* having the molecular formula C_2H_6O.

BIOLOGY
First Paper.
Zoology.
Maximum marks : 40.

[*Only* **five** *questions should be attempted. Question No. 1 is compulsory. Answers should be illustrated with suitable diagrams.*]

1. Make a neat and labelled diagram of a transverse section of the skin of Frog. Give all histological details. (A description of the section is not required).　8

Which part of the skin of a mammal is it that gives us the leather of which we make our boots and shoes ? What are the histological peculiarities of this part ?

2.   Describe the alimentary canal of the   8
Rabbit. Make a diagram carefully showing
the parts clearly displayed and named.

3.   Describe the organs concerned with   8
reproduction in the earthworm *Pheretima*.

4.   Classify the Vertebrates, giving distin-   8
guishing characters of various classes.

To what groups of the Animal Kingdom   8
do the following belong ?—

Kangaroo, leech, crocodile, butterfly and
a coral.

5.   Write illustrated note on the follow-   8
ing :—Notochord ; trichocysts ; blastopore ;
foramen of Munro ; centrosome ; carotid
labyrinth ; nematocysts and sphenethmoid.

6.   Give an illustrated account of the life   8
history of Amoeba.

7.   Describe and sketch the pectoral   8
girdle of Frog, and compare it with that of
Rabbit.

8.   (*a*) Explain what you understand by   8
a " dental formula," and illustrate by re-
ference to the dental formulæ of Man and
Rabbit.

(*b*) A Frog has small teeth on its
upper jaw and none on its lower. What is
the use of these teeth ? What are the pecu-
liarities of the tongue of Frog ? Can it taste
things ?

Second Paper.
Botany.

[Only five questions to be answered.]

1. Write illustrated notes on the distin- 8
guishing features of a capsule, a. berry, a
drupe and a composite fruit. Mention some ·
familiar examples of each.

2. Draw a series of instructive sketches· 8·
to illustrate the more important stages which
lead to the secondary growth in thickness of
a Dicotyledonous stem. Why is it that
normally such growth does not take place in
a Monocotyl ?

3. Give a completely illustrated account · 8.
of the life-history of *Ulothrix*. Compare its
sexual reproduction with that of *Spirogyra*.

4. What do you think is the significance · 8·
of the phenomena of transpiration and·
respiration in plants ? How would you pro-
ceed to demonstrate that plants respire ?

5. Write a concise but profusely illus- 8
trated account of the life-history of the *Fern*
with special reference to the phenomenon of
alternation of generations.

6. Mention and describe at least six 8
familiar cases which would illustrate the
phenomenon of vegetative propagation in
plants.

7. What do you know of the following :— 8
(i) " Nitrogen " bacteria and (ii) Bacteria that
cause various diseases in man.

QUESTION PAPERS.

INTERMEDIATE EXAMINATION, 1925.

ENGLISH.

FIRST PAPER.

(Prose and Unseens.)

1. Explain fully with reference to the context any *three* of the following :—

(a) When the oligarchy came, the Thirty sent for me, with four others, to the Council-chamber, and ordered us to bring over Leon the Salaminian from Salamis, that they might put him to death.

(b) Know well, my dear friend Crito, that this is what I seem to hear, as the worshippers of Cybele seem, in their frenzy, *to* hear the music of flutes : and the sound of these words rings loudly in my ears, and drowns all other words.

(c) For as in nothing is a gentleman better to be discerned from a vulgar person, so in nothing is a gentle nation (such nations have been) better *to* be discerned from a mob, than in this,—that their feelings are constant and just, results of due contemplation, and of equal thought.

(d) That was the first mystery of life to me. But while my best energy was given to

the study of painting, I had put collateral effort, more prudent if less enthusiastic, into that of architecture : and in this I could not complain of meeting with no sympathy.

2. Answer the questions in *one* only of the following passages, *either (a) or (b)* :—

(a) According to you, *the demigods who died at Troy would be men of no great worth,* and among them the son of Thetis, *who thought nothing of danger when the alternative was disgrace.* For when his mother, a goddess, addressed him, as he was burning to slay Hector, I suppose in this fashion, 'My son, if thou avengest the death of thy comrade Patroclus, and slayest Hector, thou wilt die thyself, for, "*fate awaits thee straightway after Hector's death*" '; he heard what she said, but he scorned danger and death ; *he feared much more to live a coward,* and not to avenge his friend. ' Let me punish the evil-doer and straightway die,' he said, ' that I may not remain here by the beaked ships, *a scorn of men, encumbering the earth.*'

(b) You may think perhaps, a Greek knight would have had a lower estimate of woman than this Christian lover. *His own spiritual subjection to them was indeed not so absolute* ; but as regards their own personal character, it was only because you could not have followed me so easily, that I did not take the Greek woman instead of Shakes-

peare's ; and instance, for *chief ideal types of human beauty and faith,* the simple mother's and wife's heart of Andromache ; the divine, yet rejected wisdom of Cassandra ; the playful kindness and simple princess-life of happy Nansicaa ; *the housewifely calm* of that of Penelope, with its watch upon the sea ; the ever patient, fearless, hopelessly devoted piety of the sister, and daughter in Antigone ; the bowing down of Iphigenia, lamb-like and silent, and, finally, *the expectation of the resurrection,* made clear to the soul of the Greeks in the return from her grave of that Alcestis, who to save her husband, *had passed calmly through the bitterness of death.*

(a) (1) Explain fully the italicised phrases.

(2) Write *brief* notes on the following :—Troy : Hector : Patroclus : Thetis : beaked ships.

Or,

(b) (1) Explain fully the italicised phrases.

(2) Write *brief* notes on the following :—Andromache : Penelope : Iphigenia : Cassandra : Alcestis.

3. Which do you consider to be the best   5 character in the Tale of Two Cities ? Give reasons for your answer.

Or,

Contrast the characters of Miss Pross and Madame Defarge.

4. Compare the standing army of 1685 5
as described by Macaulay with the army of
the present day.

<div align="center">*Or*,</div>

Compare the news-letters of 1685 with
our modern press.

5. Give three main differences between 5
the style of Macaulay and Dickens.

<div align="center">*Or*,</div>

Which author do you prefer, Macaulay or
Dickens ? Give reasons for your answer.

6. And now that the war is over, what is 10
the outcome of all these efforts as far as
India is concerned ? Has India as a whole
benefited in coming through such a trying and
searching ordeal ? India as a whole has un-
doubtedly benefited in various ways both
directly and indirectly. Directly indeed she
has earned the well-deserved gratitude of the
Empire, and has staked her claim in no
doubtful way of being considered an integral
and more or less independent portion thereof.
Indiretly India has been welded together and
solidified into one mighty nation. Her sons
have fought the good fight and have won.
The lessons learned during the Great War
will never be forgotten, but on the contrary
will be handed down and bear continuous
fruit from generation to generation. These
lessons were truth, justice, self-sacrifice, dis-
cipline, method, organisation, and last but

not least, sympathy, a sympathy* which makes for universal brotherhood, and which in time to come may eventually evolve, " A parliament of man, a federation of the world."

(a) Give in not more than six lines of your answer-book the meaning of the above passage.

(b) Parse the words marked with the asterisks.

(c) Analyse the last sentence.

SECOND PAPER.

(Poetry and Unseens.)

(*N.B.—Marks will be deducted for errors in English.*)

· 1. Mention and illustrate *one* distin- 6
guishing peculiarity of any *three* of the follow-
ing poets :—Browning, Shelley, Keats,
Tennyson, Longfellow.

Or,

Give a brief summary of *The Grammar-
ian's Funeral.*

2. Explain briefly with reference to the 8
context any *two* of the following passages :—

(a) Others mistrust and say, " But
time escapes :
Live now or never ! "
He said, " What's time ? leave
Now for dogs and apes !
Man has For-ever."

(b) The same that oft-times hath
     Charm'd magic casements, opening
        on the foam
   Of perilous seas in faery lands forlorn.

(c) This man who wears my semblance
        to your eyes,
   Is an imposter in a king's disguise.

(d) More bounteous aspects on me beam,
     Me mightier transports move and
            thrill ;
   So keep I fair through faith and prayer
   A virgin heart in work and will.

3.   Give in your own words the meaning   7
of *one* of the following passages, taking care
not to let your answer exceed in length the
passage which it explains :—

   (a) Well, here's the platform, here's the
            proper place :
         Hail to your purlieus,
      All ye highfliers of the feathered race,
         Swallows and curlews !
      Here's the top-peak ; the multitude
         below
      Live, for they can, there :
      This man decided not to Live but
         Know—
         Bury this man there ?
      Here, here's his place, where meteors
         shoot, clouds form,
         Lightings are loosened,

Stars come and go ! Let joy break
        with the storm,
                Peace let the dew send !
Lofty designs must close   in   like
        effects :
                Loftily lying,
Leave him—still loftier than the
        world suspects,
                Living and dying.

(b) A maiden knight—to me is given
                Such hope I know not fear ;
I yearn to breathe the airs of heaven
                That often meet me here.
I muse on joy that will not cease,
        Pure spaces clothed in living
                beams,
Pure lilies of eternal peace,
                Whose odours haund my dreams ;
And stricken by an angel's hand,
        This mortal armour that I wear
This weight and size, this heart and
        eyes,
                Are touched, are turned to finest
                air.

4. Rewrite in simple prose : —   6
                Either,
        Away ! away ! for I will fly to thee,
                Not charioted by Bacchus and
                        his pards,
        But on the viewless wings of poesy,
                Though the dull brain perplexes
                        and retards

Already with thee ! tender is the night,
> And haply the queen moon is
> > on her throne,
> > Clustered around by all her
> > starry fays ;
But here there is no light,
Save what from heaven is with the
breezes blown.
> > Through verdurous glooms and
> > winding mossy ways.
> > > *Or,*

When down the stormy crescent goes.
> A light before me swims.
Between dark stems the forest glows,
> I hear a noise of hymns ;
Then by some secret shrine I ride ;
> I hear a voice, but none are there ;
The stalls are void, the doors are wide.
> The tapers burning fair.
Fair gleems the snowy altar cloth,
> The silver vessels sparkle clean,
The shrill bell rings, the censer
> > swings,
And solemn chants resound between.

5. Compare the characters of Antonio
and Shylock.   6:

> > > *Or,*

Illustrate Shakespeare's skill in plot
construction from *The Merchant of Venice*.

> > > *Or,*

Give in not more than two hundred
words a description of the *Trial-Scene* from.
The Merchant of Venice.

6. In the following passage what a quali-
ties are suggested as constituting true free-
dom ?—

> Where the mind is without fear and
>   the head is held high ;
> Where knowledge is free ;
> Where the world has not been broken
>   up into fragments by narrow domes-
>   tic walls ;
> Where words come out from the depth
>   of truth ;
> Where tireless striving stretches its
>   arms towards perfection ;
> Where the clear stream of reason has
>   not lost its way in the dreary desert
>   sand of dead habit ;
> Where the mind is led forward by
>   Thee into ever-widening thought and
>   action—
> Into that heaven of freedom, my Fa-
>   ther, let my country wake.

7. Give a clause analysis of the follow-
ing passages :—

> Our constant companion and playmate
>   in those days was a dog, whose
>   portrait has never faded from re-
>   membrance, for he was a dog with
>   features and a personality which im-
>   pressed themselves deeply on the
>   mind.

*[For all candidates whose mother-tongue
is not English.]*

I. E.—5

8. "It is perfectly possible for a man, not *a professed student*, and who only gives to reading the leisure hours of a business life, to acquire such a general knowledge of the laws of nature and the facts of history that *every great advance made in either department shall be to him both intelligible and interesting*; and he may besides *have among his familiar friends many a departed worthy whose memory is embalmed in the pages of memoir or biography.* All this is ours for the asking. All this we shall ask for if only it be our happy fortune to love for its own sake the beauty and the knowledge to be gathered from books. And if this be our fortune, the world may be kind or unkind it may seem to us to be *hastening on the wings of enlightenment and progress to an imminent millennium,* or it may weigh us down with the *sense of insoluble difficulty and irremediable wrong*; but whatever else it be, so long as we have good health and a good library, it can hardly be dull."

(a) What two classes of readers are alluded to in the passage ?

(b) Describe in your own words the advantages derived from a love for books.

(c) Explain the parts in *italics.*

[For those candidates whose mother-tongue is English.]

A.

Write an essay, not exceeding two hundred words on the spiritual and allegorical significance of the *Idylls of the King.*

Or,

Describe in about two hundred words the impression of England in the Eleventh century which you get from reading *Hereward the Wake.*

B.

Explain, with a short reference to the context, and annotate any *two* of the following passages :—

(a) . . . . . . last a heathen horde,
  Reddening the sun with smoke and earth with blood,
  And on the spike that split the mother's heart
  Spitting the child, brake on him, till, amazed
  He knew not whether he should turn for aid.

(b) And Arthur and his knighthood for a space.
  Were all one will, and thro' that strength the king.
  Drew in the petty princedoms under him,
  Fought, and in twelve great battles overcame
  The heathen hordes, and made a realm and reigned.

(c) So said he, and the barge with oar and
  sail
  Moved from the brink, like some full-
   breasted swan
  That, fluting a wild carol ere her death.
  Ruffles her pure cold plume, and takes
   the flood
  With swarthy webs.

(d) So spake he, clouded with his own
  conceit,
  And hid Excalibur the second time,
  And so strode back slow to the
   wounded king.

(e) That candle, he knew, duly lighted
  and carried would enable the witch
  to walk unseen into any house on
  earth, yea, through the court of
  King William himself, while it
  drowned all men in preter-natural
  slumber.

(f) To have lived to keep that man for her
  own, and just when her work seemed
  done, to lose him ! No, there was
  worse than that. To have lived
  that she might make that man a
  perfect knight, and just when her
  work seemed done, to see him lose
  himself.

THIRD PAPER.

(Urdu.)

N. B.—*Name the vernacular from which your translation is made.*

1. Translate into English :—

ایک بگڑے ڈاکو کو مرنے کے لئے آمادہ کرنے کو ایک
فرانسیسی پادری بلایا گیا اور دونوں ایک چھوٹے تاریک
کمرے میں بند کر دئے گئے - لیکن پادری نے دیکھا کہ ڈاکو
اُس کے وعظ پر ذرا بھی توجہ نہیں کرتا ٭

اس نے کہا - " بڑا تعجب ہے ! دوست - تمکو
معلوم نہیں ہوتا کہ چند لمحوں کے بعد تمہیں خدائے
سامنے حاضر ہونا ہے ؟ وہ کون سی بات ہے جو تمہارے
خیالات کو ایسے اہم معاملے سے ہٹائے ہے ؟ "

اُس نے جواب دیا - " بابا ! آپ شرم کہتے ہیں
لیکن میں اپنے دل سے یہہ خیال نہیں نکال سکتا کہ
میری جان بچا لینا آپ کے اختیار میں ہے - بھلا یہہ
فکر میرے خیالات کو کیوں نہ منتشر کرے ؟ "

میں تمہاری جان بچاؤں ! یہہ کیونکر ہوسکتا ہے؟
علاوہ اسکے میں تمہاری زیادہ بدمعاشی کرنے کا
اور گناہوں کے دبہنے کا ذریعہ بن جاؤں گا " -

" نہیں ! نہیں ! بابا ! میں آپ کو زبان دیتا
ہوں - میں پھانسی کے پاس اتنا پہونچ گیا ہوں کہ
دوبارہ خطرے میں نہ پڑوں گا " -

پادري نے وہي کيا جو ايسے موقع پر بيشتر لوگ
کرتے-اُس نے اس کي التجا کو مان ليا- اب کام يہہ رہا
کہ چھترا نے کی تدبير معلوم کي جائے - گرجے ميں ايک
ھي کھڑکي تھي جو چھت کے پاس زمين سے پندرہ فٹ
بلند تھي -

"کيوں ؟ بابا ! اُس لکڑي نے چبوترے کو جو ہت
سکتا ہے ديوار سے لگا ديجئے اور اپني کرسي اُس پر
رکھديجئے اور آپ کرسي پر کھڑے ہوجائيے- ميں آپکے
کندھوں پر کھڑا ہوجاؤں گا اوراُس ترکيب سے کھڑکي
تک پہونچ جاوں گا اور کام ہوجاے گا ﷽"

پادري راضي ہوگيا -بدمعاش آيہ اُن ميں باہر
نکل گيا اور مہربان بابا سب چيزيں ٹھکانے لگا کے
کرسي پر اطمينان کے ساتھہ بيٹھہ گيا - گھنٹہ دو
گھنٹہ بعد جلاد نے اکتاے دروازہ کھٹکھٹايا اور پادري
سے پوچھا کہ مجرم کيا ہوا ﷽

"مجرم !" بابا نے سنجيدگي سے جواب ديا-" وہ
ضرور کوئي فرشتہ تھا کيونکہ (پادري کي بات سچ مانو)
وہ اس کھڑکي ميں سے اڑگيا - " بيس برس بعد پادري
ايک جنگل ميں ہوکے سفر کررہاتھا کہ اسے اتفاق سے
ايک خوشحال کسان ملا جس نے اس کا اپنے جھوپڑے
ميں خير مقدم کيا -يہہ کسان وہي ڈاکو تھا جسے
اس نے موت سے بچايا تھا ﷽

2.   Write an essay covering not more than 25 *six* pages of your answer-book on *either* (not both) of the following subjects :—

' Life in modern India as compared with life in the olden days.'

Or

' The debt we owe to Science.'

THIRD PAPER.
(Hindi)

N. B.—*Name the vernacular from which your translation is made.*

1.   Translate into English :—   25

एक पक्के डाकू को मरने के लिये प्रस्तुत करने को एक फरासीसी पादरी बुलाया गया । दोनों एक छोटे अँधेरे गिरजे में बन्द कर दिये गये । परन्तु पादरी ने देखा कि डाकू उसकी शिक्षा पर कुछ भी ध्यान नहीं देता था । उसने कहा, "बड़ा आश्चर्य है ! मित्र तुमको विदित नहीं है कि कुछ ही क्षण में तुम्हें ईश्वर के सामने जाना है । वह कौन सी बात है जो तुम्हारे विचारों को ऐसी दारुण व्यवस्था से भटका रही है ?"

उसने उत्तर दिया, " बाबा तुम सच कहते हो । परन्तु मैं अपने चित्त से यह बात नहीं हटा सकता कि मेरे प्राण बचाना आपकी शक्ति में है । भला यह चिन्ता मेरे विचारों को क्यों न भटका दे " ?

B.

एषा प्रसन्नस्तिमितप्रवाहा
     सरिद्विहरान्तरसावतन्वी ।
मन्दाकिनीं भाति नगोपकण्ठे
     मुक्तावली कण्ठगतेव भूमेः ..
चिप्रं ततोऽध्वन्यतुरङ्गयायो
     यविष्ठवद्धृततमोऽपि राजा ।
आख्याय केभ्यः श्रुतसूनुवृत्तिर-
     म्लायमानो मिथिलामगच्छत् ॥

C.

असौ पुरस्कृत्य गुरुं पदातिः
     पश्चादवस्थापितवाहिनीकाः ।
वृद्धैरमात्यैः सह चीरवासा
     मामर्घ्य पाणिभिरतोऽभ्युपैति ॥
हिरण्मयी साललतेव जङ्घमा-
     च्युतादिवः स्वास्नुरिवाचिरप्रभा.
शशाङ्कान्तेरधिदेवताकृतिः
     सुता ददे तस्य सुताय मैथिली ॥

D.

पातुं न प्रथमं व्यवस्यति जलं युष्मास्वपीतेषु या
नाऽऽदत्ते प्रियमण्डनामपि भवतां स्नेहेन या पल्लवम् ।
आद्ये वः कुसुमप्रसूतिसमये यस्या भवत्युत्सवः
सेयं याति शकुन्तला पतिगृहं सर्वैरनुज्ञायताम् ॥

2.   Explain the following in Tika-form in 12 Sanskrit.—

(a) एते वयं सैकतभिन्नशुक्तिपर्य-
       स्तमुक्तापटलं   पयोधेः ।
     प्राप्ता मुहूर्तेनविमानवेगात्
       कूजं फलावर्जितपूगमालम् ॥

(b) अनेकशोनिर्जितराजकस्त्वं
       पितॄनताप्सीन् परकतोयैः ।
     सङ्क्षिप्य संरम्भसद्विपंत्तं
       काऽऽस्थाऽर्भकेऽस्मिंस्तव राम रामे ॥

(c) अभिजनवत्तो भर्तुः श्लाघ्ये स्थिता गृहिणीपदे
     विभवगुरुभिः कृत्यैस्तस्य प्रतिक्षणमातुरा ।
     तनयमविरात्प्राचीवार्कं प्रसूत च पावनं
     मम विरहजां न त्वं वत्से शुचं गणयिष्यसि ॥

3.   Give the substance of the following   4 in English :—

     अर्थो हि कन्या परकीय एव
       तामद्य सम्प्रेष्य परिग्रहीतुः ।
     जातो ममायं विशदः प्रकामं
       प्रत्यर्पितन्यास इवान्तरात्मा ॥

4.   (a) Expound and name all the com-   4 pounds underlined in groups A, B, and C in Question I.

     (b) Derive श्रेयसि and प्रसक्त ।   1

(c) Decline the bases of चीरवासः and दिवः 2
in द्वितीया and प्रथमा respectively.

(d) Conjugate the root of ददौं in लोट् ।

SECOND PAPER.

1. Describe in Sanskrit the character of 3
Punya Varma.

2. Translate the following into Eng- 15
lish :—

(a) देव यथा त्वया ह्योपकारिकी न तथाऽन्यत् ।
अत्र हि व्यायामोत्कर्षादाप्तसुरक्तर्ता दीर्घाह्विलङ्घनचमो
जङ्घाजवः, कफाप्रचयादारोग्यैरमूलमाश्रयाग्निदीप्तिः, मेदोप-
चयादङ्गानां स्थैर्यंकार्क्ष्यातिलाघवादीनि, शीतोष्णवातव-
र्षक्षुत्पिपासासहत्वम् सर्वानामवस्थान्तरेषु, चित्तचेष्टितज्ञा-
नम्, हरिणगवलगवयादिवधेन तस्यलोपप्रतिकिया, वृकव्या-
घ्रादिघातेन स्थलपथगल्यगोधनम्, शैलाटवीप्रदेशानां
विविधिकर्मक्षमाणामालोचनम्, प्राटविकवर्गविश्रम्भणम्,
उत्साहशक्तिसम्युत्तरौन प्रयत्नोकविन्नासनमिति बङ्तमा
गुणाः ।

(b) तत्र त्रिपथगां दिव्यां शिवतोयामशैवलाम् ।
         ददर्श राववो गङ्गां पुण्यामृषिनिषेविताम् ॥
         उन्नाघानाह्रदासोग्रां फेननिर्मलहासिनीम् ।
         कचिद्वेणीकृतजलां कचिदावर्त्तगोभिताम् ॥

(c) मदसिक्तमुखैर्मृगाद्विपः
         करिमिर्वंत्तयसे स्वयं हतैः ।

लघयन् खलु तेजसा जगन्न
    महानिच्छति भूतिमन्यतः ॥
अभिमानधनस्य गत्वेरऽसुभिः
    स्यास्नुयशश्चिचीषतः ।
अचिरांशुविलासचञ्चला ननु
    लक्ष्मीः फलमानुषङ्गिकम् ।

3. येऽपि मन्त्रकक्ष् शास्त्रन्त्रकर्त्तारः शुकाङ्गिरसवि-
शालाक्षवाहुदन्तिपुत्रपराशरप्रभृतयस्तै: किमरिषड्वर्गो
जित: कृतं वा तैः शास्त्रानुष्ठानम् । तैरति हि प्रारब्धेषु
कार्येषु दृष्टे सिद्धऽसिद्धी । पठन्तश्चापठद्भिरतिसन्धी-
यमाना बह्वः । ननिवदमुपपन्नं देवस्य, यदुत सर्वलो-
कस्य बन्ध्या जातिः, अयातयामं वयः दर्शनीयं वपुः,
अपरिमाणा विभूतिः । तत्सर्वं सर्वाविश्वासहेतुना
सुखोपभोगप्रतिवर्न्धना   वहुमार्गविकल्पनात्सर्वकार्ये-
ष्वमुक्तसंशयेन तन्त्रावापेनमा कृथा वृथा ।

    (a) Explain the above in Tika form.

    (b) Enumerate अरिषड्वर्ग ।

    4. (a) Expound and name the samasas 7
is underlined expressions in question 2.

        (b) Account for the case ending
        तन्त्रावापेन in question 3.

        (c) Derive पिपासा ।

        (d) Decline the base in वपकर्त्ता in सप्तमी ।

        (e, Conjugate क्षम् in लिट् in third person.

THIRD PAPER.

1.   Write in Sanskrit the main story of   8
the Mahabharata in about twenty lines.

2.   Translate the following into Sanskrit:—
Praharaka was the lord of Mithila.   7
Rajahamsa, King of Mithila was his inti-
mate friend.   The queens of both, Vasumati
and Priyamvada, were also fast friends.   The
queen of Mithila desired to see her friend,
the queen of Magadha.   So she left Mithila
with her husband and reached Pataliputra in
fifteen days.

3.   Translate the following into English :-

(a) अयं निजः परो वेति गणना लघुचेतसाम् ।

   उदारचरितानां तु वसुधैव कुटुम्बकम् ॥

(b) गांते च भरते रामो लक्ष्मणश्च महाबलः ।

   पितरं देवसंकाशौ पूजयामांसतुस्तदा ॥

(c) हा राम हा रमण हा जगदेकवीर

   हा नाथ हा रघुपते किमुपेक्षसे माम् ।

   इत्यं विदेहतनयामुहुरालपन्ती-

   मादाय राक्षसपतिर्निभसा जगाम ॥

4.   (a) Analyse and name the समास in   1
महाबलः ।

(b) Account   for   the   case-endings   2
[विभक्ति] in भरते and पितरं ।

(c) Decline the base of अयं in femi-   2
nine gender in तृतीया विभक्ति only [in all the

numbers], and वसुधा in चतुर्थी विभक्ति only [in all
the numbers].

(d) Conjugate in third person only 2
पूज् in लृट् [future] and गम् in विधिलिङ् ।

PERSIAN.
First Paper.

1. Translate clearly into English :—

(a) میفرمودند خود نپذیرد که بخردی بدانستگی 6
بر خلاف ایزدی فرمان رود لیکن برخی بمساوی
کتب نگروند وذات بی زبان را حرف سرا ندانند
ولختی را در فراگرفتن دگر گودگی رود – میفر
مودند ریزش فیض ایزدی بر همگان یکسان است
لیکن لختی از هنگام نرسیدگی و برخی از بی،
استعدادی کامروا نشوند چنانچه لختی کردار
کوزه گر از راستی ایس گفتار بر گودید –

Explain the sentence overlined in 2
the above passage.

(b) بعد از نشستن ما شرفا و قصاه و نواب 2
روی صندلیهای دیگر نشسته شروع بنوشتن کاغذها
نمودند لردمر خطبهٔ روی کاغذ نوشته بود ازروی
صندلی برحاسته ایستاده قرات کرد – خطبهٔ
بسیار مفصل فصیح غراری در تهنیت ورود ما بود.
و طول کشید تا قرأت شد-وقت خواندن خطبه
تمامی اهالی مجلس دست می زدند،و بتختهها
و میزها بامی کوفتند بطوریکه صدای رعد می

کرد – لارنسون که سابق در طهران وزیر مختار
بود وحالا پیر شده است خطابهٔ لردمر را ترجمه
کرد ماهم جوابی در مقابل خطابهٔ لومر تقریر کردیم–

2. Explain in English *or* Persian :—

3 (a) هفتمین قلعهٔ گردوں بسیاهی بخشد
گر نخواهد که بود والی کیواں در سر
باش تا کنگرهٔ قصر نو در پایهٔ قدر
آید از طارم ایں بر شده ایوان بر سر
باش تا خسرو اقبال تو بر صدر جلال
تخت قیصر نهد و افسر خاقان بر سر

1 — : قیصر and کیواں Write short notes on

4 (b) دوش می آمد و رخسارهٔبر افروخته بود
تا کجا باز دل غمزدهٔ سوخته بود
دلبسی خوں بکف آورد ولی دیده بریخت
الله الله که تلف کرده که اندوخته بود
جان عشاق سپند رخ خود میدانست
واتش چهرهٔ بریں کار بر افروخته بود
گرچه می گفت که زارت بکشم میدیدیم
که نهانش نظرے بامن دلسوخته بود

(c) همای گو مفگن سایهٔ شرف هرگز
بران دیار که طوطی کم از زغن باشد

3 Analyse the above couplet.

3. Write a short biography of Salam   4
Saoji or Hafiz in your own Persian and

mention some features of his poetry which
are attractive to you.

2 4. (a) Distinguish between تشبيه and استعاره
and illustrate your answer by examples.

2 (b) Define رباعي or give the various meanings
of ياي مجهول in Persian.

SECOND PAPER.

Translate into English :—

15 (a) بيرم خان ترگمان ازكوشتهٔ بادشاه سراسيمه
شده عرضداشتى مشتملبرانكه حاشا نسبت به
جمعي كه به مراسم نيكو بندگي ابن درگاه قيام
مي نمايند بدي در خاطر خير خواه باشد بقلم
آورده مصحوب حاجي محمد خان سيستاني
و ترسون بيگ بدهلي فرستاد مگر چون كار از
دست رفته بود كسي گوش به يشان نه كرده هر
دو مقيد و محبوس گشتند و ابن خبر انتشاريافته
امرا و منصبداران فوج فوج از بيرم خان جدا
شده راه دهلى پيش گرفتند . وشاه ابوالمعالى
كه در لاهور از بندر گريخته نزد كمال خان كهكر
رفته بود كمال خان را تحريك تسخير كشمير نمود
و چون كمال خان بوسوسهٔ اوبه كشمير رفته بعد از
جنگ صعب شكست يافت وي را از خود جدا
ساخت و شاه ابوالمعالى بدىمال بور رفته نسبت
به بهادر خان ارادهٔ غدر نموده بهادر خان او را

I. E.—6

گرفته بجانب سنده اخراج کرد شاه ابوالمعالی
ازانطرف به گجرات آمد ۔

20   (b) او بادشاهی بود بلطف طبع و حسن خلق
موصوف وبه عیش ونشاط مشغول و از علم ریاضی
و نجوم بهرهٔ تمام داشت چنانچه کرهٔ ارض را از
مس و برنج تیار نموده بالوان مناسب رنگ
کرده بود و نیز هفت مجلس ترتیب داده بود
در مجلس اول که بقمر منسوب بود ایلچیان
ومسافران بودند، در مجلس دوم که بعطارد
نسبت داشت پیران و دبیران و باقی را بدین
قیاس توان کرد و اهل هریک مجلس جامه به
رنگی که بان مجلس نسبت داشت می پوشید
وانحضرت هریک روز از روزهای هفته دریکی ازین
مجالس بسر می برد و اسم شریفش اکثر دریں
کتاب " حفت آشیانی" است ۔

THIRD PAPER.

Translate the following passages into Persian :—

A.   15

The Egyptians are said to have been the
first to recognise the doctrine of a future life
and the principles of human conduct. They
belived in future recompense and punish-
ment. Man descended into the tomb only to
rise again. The soul of man was considered

immortal like the sun and accomplishing the
same pilgrimages.   All bodies descended
into the lower world, but they were not all
assured of resurrection.   Annihilation was
the lot of the Sinners : the righteous entered
into perfect happiness.

<div align="center">B.</div>   15

It is related of a certain tormentor of men
that he struck a certain pious man on the
head with a stone.   The Dervish dared not
avenge himself at the time, but kept the
stone by him till the King imprisoned him
in a dungeon.   Thereupon the Dervish came
and smote him on the head with the stone.
' Who art thou,' cried the other, ' and why
dost thou strike me with this stone ? ' ' I am
that same man,' replied the Dervish, ' on
whose head thou didst, on such-and-such a
date, strike this same stone.' ' Where wert
thou all this time ? ' inquired the other.   ' I
was afraid of thy position,' answered the
Dervish, ' but now seeing thee in this plight,
I seized my opportunity.'

<div align="center">

HINDI.
FIRST PAPER.
N.B.—*For girls only in place of a classical*
language.

</div>

1. Re-write the following extracts in
your own Hindi in a simple style, avoiding
the use of figurative language :—   9

(a) वहाँ सवेरे की हवा से धरती पर हरा

विछौना विछाता, वसंत ऋतु के मेघ से पौधा रूपी
वालकों को मट्टी के पालने में झुलवाता, वही पेड़ों को
मानो नौरोज़ के जलसे में हरी मखमल का जोड़ा
पहिनाता, डालियों के सिरे पर वसंत ऋतु के आने
पर कलियों की टोपी बढ़ाता है । उसकी शक्ति है
जिससे मक्खी का उगाल मधुर मधु बन जाता है
और छुहारे की गुटली से ऊँचा पेड़ निकल आता है ।

(b) मान्धाता, जो एक समय नृपकुल का शिरो-
मणि था, अब परलोक में है । राबणारि रामचन्द्र,
जिन्होंने समुद्र में सेतु बाँधा था, कहाँ हैं ? और बहुत
से महोद्यगण और राजा युधिष्ठिर ने स्वर्गारोहण
किया है, परन्तु पृथ्वी उनके साथ नहीं गई । पर अब
(मुंज) के साथ पृथ्वी अवश्य रसातल को जायगी ।

(c) जयदेव जी का यह अभिमान कि अंगूर
और ऊख की मिठास उनकी कविता के आगे फीकी
है, बहुत सत्य है । इस मिठाई को न पुरानी होने का
भय है, न चींटी का डर है, मिठाई है पर नमकीन है,
यह नई बात है, सुनने पढ़ने की बात है पर गूँगे का
गुड़ है ।

2.   When reference to the extracts in
Question I deal with the following points :—

    (a) Comment on the expressions कलियों की   3
टोपी बढ़ाता है and जिन्होंने समुद्र में सेतु बाँधा था । If the
expressions arc defective, give the accurate

forms. If there is no defect, justify the use
of वदाता है and समुद्र में ।

(b) What do you understand by the   2
phrase मिठाई है पर नमकीन है ? Justify the
apparent contradiction involved in it.

(c) What is the meaning of the expres-   2
sion गूँगे का गुड़ ? For what it is used here ?

3. Explain fully the following sentences :—

(a) जब तक हिन्दू साहित्य वर्तमान रहेगा तब   3
तक लोग भोज प्रमर श्रौर नवरत्नों को न भूलेंगे ।

(b) मनुष्यों की अाधारभूता पृथ्वी इस अनर्थ   3
मिथ्यावाद को न सह सकी श्रौर द्विधा विदीर्ण
हो गई ।

(c) श्रपनी मूर्खता उससे वढ़ कर कोई नहीं   2
जानता जो दूसरे की वात पूरी होने के पहले वीच में
वोल उठता है ।

4. Give the meaning of and write sen-   3
tences to illustrate the use of the following
phrases :—

तान मार कर हँसना, घात में रहना, सितारा
चमकना, मुँह मोड़ना ।

5. Give the paraphrase of the following   8
extracts in Hindi :—

(a) रामायण में भगवान वालमीकि ने कहा है
कि जो वस्तु हुई हैं नाश होंगो, जो खड़ी हैं गिरेंगो,

जो मिली हैं विछुड़ेंगी और जो जीते हैं अवश्य मरेंगे ।
सच है, इस जगत की गति पहिये की आर की भाँति
है । जो आर अभी ऊपर थी नीचे गई और जो ऊपर
थी नीचे हो गई । आधी रात को सूर्य का प्रचंड तेज
कहाँ है जो दोपहर को था । दिल को ठढ़ी किरनों से
जी हरा करने वाला चन्द्रमा कहाँ है ! संसार गति है ।

(b) वगसि वितुंड दये भुंडन के भुंड रिपु-मुंडन
की मालिका दई ज्यों त्रिपुरारी को । कहै पद्माकर
करोरन को कोष दये पोइसहू दीन्हे महादान अधिकारी
को । ग्राम दये धाम दये अमित आराम दये अन्न जल
दीने नगदी के जीवधारी को । दाता जयसिंह दोय
वातें तो न दीनी कहूँ वैरिन को पीठि और दीठि पर-
नारी को ॥

SECOND PAPER.

N.B.—*For girls only in place of a classical language.*

    1.   प्रभु मोरे अवगुन चित्त न धरो ।

समदरसी है नाम तिहारो, चाहे तो पार करो ॥
इक नदिया इक नार कहावत, मैलोहि नीर भरो ॥
जब दोनों मिल एक वरन भये, सुरसरि नाम परो ॥
इक लोहा पूजा में राखत, इक घर वधिक परो ॥
पारस गुन अवगुन नहिं चितवै, कञ्चन करत खरो ॥
यह माया भ्रम जाल कहावै, " सूरदास " सगरो ॥
अव की वार मोहि पार उतारो, नहिं प्रन जात टरो ॥

(a) ऊपर की कविता का भावार्थ लिखो ।

(b) इस प्रार्थना में ईश्वर से का माँगा है ?

(c) " पार करो, " नदी, " " पारस, "
" लोहा, " आदि किसके वास्ते आए हैं ?

2. देखो री दुर्वासा रिषि जाँय रिसाने । इनको
अतुल परभाव जग जाने ॥ झूठे नहिं होत कहु इनके
वचन । कोप सों भसम करै चौदह भुवन ॥ इनके
रिसाने नहिं कैसहु निवाह । जाऊँ री मनाऊँ जोपै मानैं
काहू राह । तौलौं करि राखौ तुम पूजा की तयारी ॥
इत्यादि ।

(a) यह कथा किस समय की है ?

(b) चौदह भुवन क्या हैं ?

(c) रिषि, अतुल, परभाव, भसम, के शुद्ध रूप
लिखो ॥

3. अहो धन्य हैं, परम धन्य हैं, ऐसे तपवत
धारी । मगन रहत प्रभु प्रेम माहिं जे देह सनेह
विसारी ॥ जिनहिं कलप विरच्छहु, के वन में, पवनहिं
भोजन भावै । सुरनारिन के बीच वसतहु, जिनहिं न
काम सतावै ॥ कंचन कमल, पराग पोत जल शिव पै
सदा चढ़ावैं । रतन सिलातल बैठि नित हरि सुमिरन
को सुख पावैं ॥ इतर लोग करि जोग जाग जप जौन
पदारथ चाहैं । तिनहिं पात पूरन मेंसिका जन अपनो
नेम निवाहैं ॥

(a) इसमें किसके क्या लच्छण बतलाएँ हैं ?

(b) मगन, सनेह, विरह्हु, पदारथ के शुद्ध रूप लिखो ।

THIRD PAPER.

N.B—*For girls only in place of a classical language.*

1. यों रहीम सुख दुख सहत, बड़े लोग सह शांति ।
   उवत चन्द्र जिहिं भांति सो, वाधवत नाहीं भांति ॥

   (a) ऊपर लिखे पद्य को गद्य में लिखो ।

   (b) Parse the words underlined.　　　4

2. नीचे लिखी संज्ञाओं के वचन बताओ:—
   कपड़ा, चिट्ठी, गुरुजन, लोटा और साधु ।

3. अपनी माता के नाम तीन पृष्ठ के एक पत्र में अपनी पाठशाला के किसी उत्सव का वर्णन करो ।

अथवा

बतलाओ कि पशु-पक्षियों से प्रेम कैसे किया जा सकता है ।

URDU.

FIRST PAPER.

N.B.—*For girls only, in place of a classical language.*

1. Explain fully the overlined words and 15 phrases in the following extracts :—

(a) جب شہر میں بھاگتر مچی مدلے والوں نے بہتیرا ہم لوگوں سے کہا کہ شہر میں رہکر کیوں مفت جان گنواتے ہو مگر ہم لوگ اس وعدہ نے آسرے پر گھر سے نہ نکلے - لوگوں سے تو قدر کے مارنے یہہ حال ظاہر نہیں کیا مگر جی ہی

جی میں دعائیں مانگ رہے تھے کہ کس دن
دہلی فتح ہو اور ہم لوگ آرام سے بیٹھیں -
خدا کا کرنا جس دن دہلی پر دھاوا ہوا - اے ہے !
خدا دشمن کو بھی وہ دن نہ دکھائے ایک قیامت
برپا تھی دن بھر گولیوں کا مینہہ برستا رہا اور
گولی خدا کی پناہ کے کان بہرے ہوجاتے تھے - شام
ہونے آئی تو نہر کے پرے پار تک انگریز آگئے تھے
کسکو امید تھی کہ زندوں کو صبح ہوگی جان
سے ہاتھ دھوکر تہہ خانوں میں چھپ بیٹھے
اللہ اللہ دررہے تھے - کس کا کھانا اور کس کا
پکانا آیک ایک کا منہہ تکتا تھا -

(b) مسیح الملک کی جو شامت آئی بیٹی کا بیاہ
کرنے اوٹے پہلا کام تھا بس و پیش کچھہ نہ
سوچا لوگوں کے حق مار کر زور ظلم سے جو
کچھہ جمع کیا تھا سب خرچ کر ڈالا بلکہ
ہزاروں کا قرضہ سر کر لیا اور نام و نمود کے
پیچھے مرمٹے - شادی کا سامان دیکھکر جہاں
پناہ کو بد گمانی ہوئی اور ستم رسیدوں کو کہتے
سننے کا موقع ملا غرض دفتر شاہی سے نام کٹ
گیا - نام کا کٹنا تھا کہ قرضخواہوں نے تنگ کرنا
شروع کیا کیا متوسلاں شاہی ناراض تو تھے ہی
راہ میں چلتے پھرتے آوازے کسنے لگے

مسیح الملك سے سوا اسکے اور کچھہ نہ بن پڑي
کہ کعبة اللہ جائیں تو سو چوٹے کہاے بلي حج
کو چلي۔ سفر کادام سنکر نوکروں چاکروں نے تکاسا
جواب دیدیا گھر کے لونڈي غلام کني کاٹ گئے ۔

2. Rewrite Part (*b*) of question 1 in your 7
own Urdu.

3. Translate into English :— 8

اتني بات ہر شخص جانتا ہے کہ ہماري اُردو
زبان برج بھاشا سے نکلي ہے اور برج بھاشا
خاص ہندوسناني زبان ہے ۔ لیکن وہ ایسي زبان
نہیں کہ دنیا کے پردے پر ہندوستان کے ساتھہ
آئي ہو ۔ اسکي عمر آٹھہ سو برس سے زیادہ نہیں
ہے اور برج کا سبزہ زار اوس کا وطن ہے ۔ تم
خیال کروگے کہ شائد اس میرات قدیمي کي
سند سنسکرت کے پاس ہوگي اور وہ ایسا بیج ہوگا
کہ یہں پھلا پھولا ہوگا ۔ لیکن نہیں ۔ سب
جانتے ہیں کہ ہندوستان اگرچہ بے ہمتي اور آرام
طلبي کے سبب سے بدنام رہا مگر باوجود اسکے
مہذب قوموں کي آنکھوں میں ہمیشہ کھپا
رہا ۔

4. Reproduce the following in simple 7
Urdu :—

ایک جلیل القدر روحاني ڈاکٹر اپني قوم کو
امراض مہلکہ میں گرفتار پاتا ہے اور اسکي ردي

حالت ديکھ ديکھ کر کڑھ رہا ہے - دفيئۂ
امراض کے لئے نسخوں پر نسخے تجويز کر
رہا ہے مگر قوم آہ بد نصيب قوم ! جام بقا
پينے سے انکار کر رہي ہے قہر خدا کا خوف
دلا رہا ہے اور نہيں مانتي عذاب آخرت کا فوٹو
کھينچ کھينچ کر دکھا رہا ہے اور مطلق پروا
نہيں کوتي - خوشامد کرتا ہے اور قوم ہنس
ہنس کر ٹال ديتي ہے لعنت ملامت سے کام ليتا
ہے اور قوم کانوں ميں تيل ڈالي بيٹھي ہے آخر
علاج کرتے کرتے مايوس ہوجاتا ہے اور درگاہ
قاضي الحاجات ميں اس طرح مناجات کرتا ہے
کہ بار الہا ميري قوم کي حالت سقيم ہے - اے
معبود حقيقي گواہ رہيو کہ ميں نے تبليغ احکام
ميں کوئي دقيقہ اٹھا نہيں رکھا -

5. Make sentences in Urdu showing the   3
appropriate use of the following proverbs :—

(۱) ناچ نہ آوے آنگن ٹيڑھا -

(۲) نو نقد نہ تيرا ادھار -

(۳) جان بچي لاکھوں پائے -

SECOND PAPER.

N.B.—*For girls only, in place of a classical language.*

1. Explain the following verses in Urdu.
Allusions, figures of speech, etc., should be
explained separately.

4   (a) جہاں ابر ظلمت میں تھا مہر انور
اندھیرا تھا غاران کی چوٹیوں پر

4   (b) پہ چالیسویں سال لطف خدا سے
کیا چاند نے کھیت غار حرا سے

7   (c) وہ بلدہ کہ غاخر بلاد جہاں تھا
ترو خشک پر جس کا سکہ رواں تھا
گرا جس میں عباسیوں کا نشاں تھا
عراق عرب جس سے رشک جناں تھا
اڑا لے گئی باد پندار اس کو
بہا لے گئی سبیل تاتار اس کو

3   (a) قیس ہوں پیدا تری محفل میں یہ ممکن نہیں
تنگ ہے صحرا تیرا محمل ہے بے لیلا ترا

3   (b) پھر دلوں کو یاد آجائے گا پیمان سجود
پھر جبیں خاک حرم سے آشنا ہوجائے گی

2. Explain in Urdu :—

4   (a) ٹھہر نے لگا جان میں اضطراب
لگی دیکھنے وحشت آلودہ خواب
کسی نے جو کچھ بات کی بات کی
یہ دن کی جو پوچھی کہی رات کی

6   (b) شیدائے بوستاں کو سرو سمن مبارک
رنگین طبیعتوں کو رنگ سخن مبارک
بلبل کو گل مبارک گل کو چمن مبارک
ہم بیکسوں کو اپنا پیارا وطن مبارک

غنچے ہمارے دل کے اس باغ میں کھلینگے
اس خدا کسے اتھے ہیں اس حاکمیں ملیفگے

3. What are the characteristics of the   4:
style of Iqbal? Distinguish it from that of
Hali.

THIRD PAPER.

N.B.—*For girls only, in place of a classical language.*
1. Define and give illustration :—   10

اسم موصول - مضاف الیہ - حاصل مصدر - حرف
اضافت - جملہ اسمیہ ٭

2. How is the comparison of adjectives   5
made in Urdu and how is the superlative
degree expressed? Give examples.

3. Write an essay in Urdu on any *one* of
the following subjects :

   (a) The life and work of your College.
   (b) The use and abuse of Poetry.
   (c) Household management.

HISTORY—MODERN (INDIAN).
FIRST PAPER.

*Only six questions need be attempted. Of these three
must be selected from section A, and three from
section B. Question No. 1 is compulsory.*

A.

1. Describe the political condition of 10
India at the close of the twelfth century.
Illustrate your answer with a map.

2. Give an account of the conquest of   8
the Deccan in the thirteenth century.

3. Discuss the effects of the Mongol invasions on India in the thirteenth and fourteenth centuries.   8

4. Narrate briefly the history of the Shaiqe kingdom of Jaunpore, or of the Adilshahi kingdom of Bijapore.   8

5. Describe the court and administrative system of Vijayanagar in the sixteenth century.   8

6. "Nothing in the history of Aurangzeb satisfies posterity in classing him as a great king." Discuss the statement in reference to the character and policy of the Emperor.   8

B

7. Narrate briefly the history of the struggle between the Portuguese and the Dutch for the dominion of the East.   8

8. Trace the growth of British administration in India in the eighteenth century.   8

9. Describe the relation of the British with Mahadaji Sindia and his successor.

10. Through what phases has the policy of the British Government towards the Indian states passed ?   8

11. Describe the various systems of land revenue settlement which were established in Bombay, Madras and the United Provinces of Agra and Oudh, by the British Government.   8

12. Give a brief account of the expansion of the British Indian empire in Trans-Gangetic reigions.   8

13. What do you understand by Local 8
self-government ? Give a short sketch of
its development in the last fifty years.

HISTORY—MODERN (ENGLISH).
SECOND PAPER.

Answer any six *questions. Question No. 12
must be attempted.*

1. Show that the Reformation in Eng- 8
land in its early phases at least, was entirely
of a political nature.

2. The romance of Elizabeth's reign is 8
on the sea. Discuss this statement.

3. Relate the points of dispute between 8
the early Stuarts and Parliament and sum-
marise the events which culminated in
civil war.

4. ' Cromwell's greatness at home,' said 8
Clarendon, ' was a mere shadow of his great-
ness abroad.' Prove this.

5. Discuss the policy of the Restoration 8
Parliaments towards the Crown, the Catholics
and the Puritans.

6. Write an account of the War of the 8
Spanish Succession. What did England gain
by the treaty of Utrecht ?

7. Before the Reform Act of 1832 the 8
House of Commons was a most undemocratic
body. How far is the statement true ?

8. Account for England's participation 8
in the wars of the French Resolution.

9. Write an account of Gladstone's first 8 ministry with special reference to his domestic and Irish reforms.

10. Describe the career and policy of 8 the elder Pitt.

11. Describe the origin and growth of 8 the Union of South Africa up to 1919.

12. Write short notes on any *four* of the 8 following :—

The Divine Right of Kings ; Catholic emancipation ; Corn laws ; the Dissenters ; The Cabinet ; The Imperial preference ; Penny post ; the Labour party.

Or,

Only six questions need be attempted. Question No. 13 must be answered.

1. Narrate the story of the Italian 8 Invasions by the French at the beginning of the Modern period. What were their results ?

2. What was the influence of the strug- 8 gle between the Houses of Hapsburg and Valois on the course of the Reformation till the Peace of Augsburg.

3. Describe the career and policy of 8 Philip II

4. What measures were adopted by 8 Richelieu and Mazarin to overcome the internal difficulties of the Kingdom ?

5. Relate the history of the rise of 8 Prussia till 1740.

6. Discuss the diplomatic relations of 8 the European nations from 1740 to 1763.

7. Describe the social, economic and 8 political conditions of France on the eve of the French Revolution.

8. What were the permanent gains of 8 France from the rule of Napoleon Bonaparte?

9. Who was Metternich? What do 8 you know about his policy?

10. What were the obstacles in the way of Italian unity? How were they removed?

11. What were the causes of the Franco- 8 German war? Describe the course of the war, and its effects.

12. What do you understand by the 8 Eastern Question? Give briefly its history till the beginning of the World War.

13. Draw a map of Europe illustrating 10 the effect of the Treaty of Paris (1763).

ANCIENT HISTORY.
FIRST PAPER.

Answer any five *questions.*

1. Show how the geographical features 10 of Greece promoted—

  (a) internal disunion.

  (b) commercial enterprise.

  (c) relations with the East.

2. What were the causes which led to 10 the foundation of the Greek colonies ? Draw a map of Sicily and insert the names of *six* of the chief colonies.

3. Give an account of *either* (*a*) the train- 10 ing of the Spartans *or* (*b*) the way in which Sparta gained the leading position in the Peloponnese.

4. Give in outline a clear account of the 10 rise and progress of the Persian Power down to 500 B.C. and explain their importance for the Greek world.

5. Describe clearly the measures adopted 10 by Kleisthenes for securing good Government and the liberties of the people.

6. Why was Athens the leading State in 10 Greece after the Persian Wars ?

7. Give a short account of the Sicilian 10 expedition, explaining clearly why Athens failed.

8. Say what you know of *three* of the 10 following :—Periander, Pericles, Brasidas, Conon, Lysander, Demosthenes.

9. Show by reference to the facts of 10 history the importance of strong sea-power in ancient Greece.

10. Sketch briefly the progress of 10 Alexander's invasion of the Persian Empire. Briefly mention its results.

Second Paper.

Answer Question 10 and any four others.

1. What were the disabilities of the 10 plebeians ? How were they removed during the struggle with the patricians ?

2. Sketch the progress of the Second 10 Punic War from the battle of Cannæ to its conclusion.

3. How did the foreign conquests of Rome affect the social and political condition of Rome and Italy in the 2nd century B.C. ?

4. What changes did Sulla make in the 10 Roman constitution ? How far were they permanent ?

5. Describe the causes and the progress 10 of the Catilinarian conspiracy. Why was Cicero criticised for his way of dealing with it ?

6. Describe and explain the position of 10 the tribunate at different periods in the history of the Roman Republic.

7. Sketch the career of Pompey the 10 Great.

8. What is meant by the First Trium- 10 virate ? Write an account of its actions and explain why it came to an end.

9. What improvements in the adminis- 10 tration of the Provinces were effected under Augustus ?

10. Draw a sketch-map of Southern Italy 10
and Sicily, showing the position of the chief
places mentioned in the war with Pyrrhus
and in the First Punic War.

DEDUCTIVE LOGIC.

(Answer six questions, of which No. 8 must be one.)

1. Logic has been described as a *regula-* 7
tive science. Explain the significance of the
epithet.

Discuss the question whether Logic
is a science or an art.

2. Enumerate and define Predicables. 7
How are they connected with Division and
Definition ?

Comment upon the following :—

'Genus is a part of Species and Species
is a part of Genus.'

3. What different views have been ad- 7
vanced regarding the Import of Propositions ?
Which view do you consider most satisfac-
tory ? Why ?

4. (a) Define the various forms of Educa- 7
tion and give an example of each form.

(b) Show that the sub-contraries can
both be true, but cannot both be false.

5. Define Figure and Mood.

Show that *O* cannot occur as major
or minor in the first and fourth figures, as

major in the second, and as' minor in the third figure.

6. Explain the nature of Reduction. Is 7 is a necessary process in Logic ?

Construct concrete examples of CAMENES and BOCARDO, and reduce them to the first figure, one of them directly and the other indirectly.

7. " All engineers are practical men.   7

Mr. Jones is an engineer.

Therefore, Mr. Jones is a practical man.

If before affirming the major premise; we have examined the case of Mr. Jones, the conclusion is superfluous ; if, on the other hand, we have not examined his case, we have no right to affirm the major, and consequently the conclusion is invalid. The conclusion is, therefore, either superfluous or invalid."

Discuss this criticism.

8. Examine any *five* of the following 15 arguments :—

(*a*) To show that something is visible, it is enough to point out that some one can see it   Similarly we can prove that Pleasure is desirable by showing that it can be desired.

(*b*) If a conclusion is validly drawn from true premises, it must be true. In the present case, the premises and the conclusion

are all true propositions. The syllogism, therefore, is quite valid.

(c) When men are pure, laws are useless; when men are corrupt, laws cannot restrain them. Laws are therefore unnecessary.

d) All laws are made for the protection of property. Beggars have no property, and so cannot claim the protection of Law.

(e) So many people can reason quite well without studying Logic, and so many reason quite indifferently inspite of having studied Logic. Why then worry about the study of the subject?

(f) Improbable events happen almost every day. What happens almost every day is a probable event. Improbable events are, therefore, probable events.

(g) I should have passed the examination, if I had studied Mill's Logic. I neglected to read the book, and therefore, shall not pass the examination.

(N.B.—*You are required to show that you can analyse the arguments selected and see where the fallacy, if any, lies. Merely mentioning the technical name of the fallacy will receive no credit.*)

LOGIC (INDUCTIVE).

(*Only* six *questions to be attempted of which No. 9 must be one.*)

1. Distinguish the various senses in which the word Induction has been used.   7

Explain clearly the nature of Scientific Induction.

2. Explain fully the difference between the Law of Causation in Induction, and the Laws of Causation discovered by Science.   7

3. What is Hypothesis? Bring out its importance in Induction. How does is differ from Theory? Illustrate your answer by examples.   7

4. Compare Observation and Experiment as means of gaining data for Reasoning.   7

5. Show how the method of agreement differs from simple enumeration. Is the latter of any scientific value at· all? What are the main defects of the method of agreement?   7

6. Show by an application of Mill's methods that the education of the masses is essential to the progress of a nation.   7

7. What is the argument from analogy? How does it differ from Induction? How could you estimate the value of an analogical argument?   7

8. How are Induction and Deduction related? Discuss this fully after carefully defining Induction and Deduction.   7

9. Analyse any *three* of the following arguments and discuss their validity, pointing out fallacies, if any.   15

(a) We should think it a sin and shame if a great steamer, dashing across the ocean, were not brought to a stop at a signal of distress from a small boat. And yet a miner is buried alive, a workman falls from a scaffold, a brakeman is crushed in coupling Railway carriages, a merchant falls ill and dies and society leaves widow and child to bitter want or degrading alms.

(b) It is said that a large number of babies die in India either at birth or within the first two years after birth and a large number of mothers also die in giving birth to children. These deaths are said to be due to ignorance of rules of sanitation and neglect of modern medical science. But this cannot be true as there are millions of babies and mothers who are alive and so after all modern medicine and surgery are not necessary to prevent the deaths of babies and mothers.

(c) The prices of food-stuffs have gone up enormously during the last twenty years. It is within the memory of some people that ‘ghee’ at one time was sold 5 seers to the rupee, and only a few years back wheat could be had at the rate of 40 seers to the rupee. During this time the area of land under irrigation has greatly increased and Railways have been built. The cause of India’s poverty must therefore be in-

creased agriculture and the Railway system
of the country.

(d) The people living in cold countries
generally possess a good physique ; for
Englishmen and Afghans who come to India
are generally tall and well-built. On the
other hand, people living in hot climates
are weak and short. But there are many
hill tribes who are short of stature and not
strong. Has climate anything to do with
the growth of the body ?

(e) People who do not go to school
generally have good eye-sight. Among stu-
dents those reading in colleges suffer from
short-sightedness more than school-boys :
and even college students have better sight
than their Professors. Education is the cause
of weak eye-sight.

ELEMENTARY ECONOMICS.

FIRST PAPER.

[Candidates must answer five Questions, not more
than three from either Section.]

Section A

1. If you had to define economics to an   7
intelligent uneducated peasant, how would
you set about it ?

Distinguish between individual and
social wealth and state what you mean by
' economic goods ' ?

2. Draw a map of India, showing the distribution of the principal crops, minerals, and modern industries.   7

3. What do you mean by the term 'density of population'? Account for the variations in density of population of the different natural divisions of the United Provinces as given below :—   7

Province & Natural Divisions	Area	Population
United Provinces	112,244	46,510,668
Himalaya, West	19,091	1,823,056
Sub-Himalaya, West	10,811	4,490,211
Indo-Gangetic Plain, West	23,903	12,145,963
Indo-Gangetic Plain, Central	22,596	11,920,193
Central India Plateau	10,440	2,065,297
East Satpuras	5,238	1,087,043
Sub-Himalaya, East	12,784	7,730,533
Indo-Gangetic Plain, East	9,381	5,248,372

4. Define the term " Capital." Distinguish between *Fixed* and *Circulating Capital.* Do you consider the following to be capital ?   7

    (i) Seed corn

    (ii) Hoarded rupees

    (iii) The good-will of a business.

5. Describe in detail the processes, organization and prospects of any cottage industry with which you may be familiar.   7

Section B.

6. Explain, as clearly as you can, the conceptions of increasing and decreasing   7

returns and consider the part played by internal and external economics in bringing about increasing returns in industry.

7. Explain the following statements so as to make their meaning clear :— 7

(a) The Demand price for a given quantity of a commodity is governed by the marginal utility of that quantity.

(b) Value tends towards the cost of production in the long run.

8. Define the term 'market.' What are the causes which influence the extent of the market for a commodity ? 7

9. Discuss briefly the characteristic features of the import and export trade of India. 7

10. Define Money. In the light of your definition discuss whether the following are money :—cheques, a currency note, a pice, and a Hundi. 7

Consider the importance of an extension of banking facilities in developing the investment habit in India.

___

SECOND PAPER.

[Five *questions to be answered, but not more than* five. *All questions carry equal marks.*]

1. "The distribution of wealth has become a practical problem because of specialisation in industry." Comment.

2. What do you mean by Land Tenure? Describe the various kinds of land tenure in the United Provinces and explain the necessity of Tenancy legislation.

3. Point out the causes of the prevalence of very high rates of interest in Indian villages and discuss any remedies you can suggest.

4. How does the standard of living affect wages. Can you get higher wages by raising your standard of living?

5. Distinguishing between a "direct" and an 'indirect' tax, and compare the merits of both. Which of the taxes in India are direct and which indirect?

6. Write out imaginary budgets for two families whose incomes are Rs. 20 per month and Rs. 2,000 per month, respectively. Explain the difference in the proportions spent under different heads in the two budgets.

7. What is the purpose of economic activities? Is a spendthrift of any use to society?

8. If the Indian import duties on all kinds of cloth were largely increased, who would bear the burden of this tax, and who would be profited by it? Will the revenue of government be necessarily increased by such a change?

MATHEMATICS.
First Paper.

Questions 1 and 5 and any five of the remaining questions should be attempted.

1. (a) Solve the equations—   4

$$x + y + z = 1\frac{1}{12}$$

$$xy + xz + yz = \frac{9}{24}$$

$$xyz = \frac{1}{24}.$$

(b) Form an equation whose roots are the reciprocals of the roots of the equation $x^2 - x + 1 = 0$.

2. (a) Sum the series $1 + x + x^2 + \dots$ to n 5 terms.

(b) If A be the Arithmetic, G the Geometric and H the Harmonic mean between two numbers a and b, prove that A, $H = G^2$.

3. (a) Find the number of permutations   5 of n things taken r at a time.

(b) How many different words can be formed out of the letters of the word 'Allahabad'?

4. (a) Prove that   5

$$\log_e (1 + x) = x = \frac{x^2}{2_1} + \frac{x^3}{3} - bc.$$

(b) Explain the method of calculating
Logarithms of natural numbers.

5. Prove that   4

$$\sin (A+B)=\sin A \cos B+\cos A \sin B.$$ Express
$\sin 3A$ in terms of $\sin A$.

6. In any triangle, prove that   5

(a) $a = b \cos C + c \cos B.$

(b) $\tan \dfrac{A}{2} \tan \dfrac{B}{2} + \tan \dfrac{A}{2} \tan \dfrac{C}{2}$

$+ \tan \dfrac{B}{2} \tan \dfrac{C}{2} = 1.$

7. Establish the following identities—   5

(a) $\dfrac{\sin 50 + \sin 70}{\sin 20 (1 + 2 \cos 20)} = 2 \cos 30.$

(b) $\sin 3A \sin^3 A + \cos 3A \cos^3 A = \cos^3 2A.$

8. Given two sides a, b and the angle
opposite to one of the sides A, solve the   5
triangle.

If $c_1 + c_2$ be the values of the third
side prove that $(c_1 - c_2)^2 + (c_1 + c_2)^2$
$\tan^2 A = 4a^2.$

9. If r_1, r_2, r_3, be the radii of the   5
inscribed circles and r be the radius of the
inscribed circle, prove that

$$(a) \quad \frac{1}{r_1{}^2} + \frac{1}{r_2{}^2} + \frac{1}{r_3{}^2} + \frac{1}{r^2}$$

$$= \frac{a^2 + b + c^2}{\Delta^2} .$$

$$(b) \qquad rr_1 = r_2 r_3 \tan^2 \frac{A}{2}.$$

SECOND PAPER.

*Questions 1 and 9, and any five of the remaining
seven are to be answered.*

1. Define two skew straight lines. What   4
is a skew quadrilateral? Shew that through
any point in space there is always one
straight line which cuts each of two given
skew lines. Criticise the definition :—
"straight lines are parallel when they do not
meet though indefinitely produced."

$\checkmark$ 2. The greatest possible cube is cut from   5
a right pyramid h inches high, standing
on a square base whose side a inches, one
face of the cube being in the plane of the
base of the pyramid. Prove that the edge
of the cube is $\dfrac{ah}{a+h}$.

3. Find the area of a triangle, the 5
co-ordinates of whose angular points are
given.

Prove that the area of the triangle
formed by three straight lines.

$x \cos a + y \sin a - p^1 = 0$, $x \cos B + y$
     $\sin B - p_2 = 0$, and $x \cos y + y$
     $\sin y = p_2 = 0$.

is $\frac{1}{2}$ $\dfrac{\left\{ p_3 \sin(y-B) + p_2 \sin(a-y) + p_3 \sin(B-a) \right\} 2}{\sin(y-B) \sin(a-y) \sin(B-a)}$

4. Shew that the points of intersection 5
of tangents at the point t_1 and t_2 of the para-
bola, $y^2 = 4ax$ is $\left\{ at_1 t_2, a(t_1+t_2) \right\}$. Hence
or otherwise prove that if the tangents to a
parabola at P and Q meet in T, TP and TQ
subtend equal angles at the focus S, and
$ST^2 = SP$, SQ.

5. Prove that if the eccentric angles of 5
the ends P and D, of a pair of conjugate
diameters of an ellipse be O and O^1; then O
and O^1 differ by a right angle.

Hence or otherwise, find the locus of
the middle point of PD, and of the intersec-
tion of tangents at P and D.

6. Obtain the equation to the normal to 5
a hyperbola.

The normal to the hyperbola

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1.$$

meet the axes in M and N, and lines MP and NP are drawn at right angles to the axes; Prove that the locus of P is the hyperbola.

$$a^2x^2 - b^2y^2 = (a^2 + b^2)^2.$$

7. Find the equation to the pair of tangents that can be drawn from an external point to a central comic.

If a pair of tangents to a central comic be at right angles to one another, prove that the product of the perpendiculars from the centre and the intersection of the tangents on the chord of contact is constant.

8. Find the polar equation of a circle.   3

O is one of the points of intersection of two given circles, and any line through O cuts the circles again in the points P, Q respectively. Find the locus of the middle point of PQ.

9. Prove that the surface of a sphere is   4
four times the area of a great circle.

A sphere of diameter 24 feet is placed so that its centre is 37 feet from an observer's eye. Find the area of that part of the sphere's surface that is visible to the observer.

THIRD PAPER.

Questions 1 and 6 and four others to be answered.

1. Enunciate the Parallelogram of Forces. 5
Two parallel forces act in the same direction along the opposite sides AB, DC of a parallelogram $ABCD$, and a third force acts along the diagonal BD; each force is proportional to the side or diagonal in which it acts; find the magnitude and line of action of the force which will keep the system in equilibrium.

2. A heavy uniform beam, of length $2a$ 6 rests over a smooth peg with one end pressing against a smooth vertical wall. The peg is at a horizontal distance b from the wall and the beam lies in a vertical plane perpendicular to the wall. Draw a figure showing the forces acting on the beam; prove that $a \not> b$ and find in terms of a and b the cosine of the angle of the beam's inclination to the horizontal.

3. Prove that the algebraic sum of the 6 moments of two parallel forces about a point in their plane is equal to the moment of their resultant. $ABCD$ is a uniform square lamina: E is a point in DB such that $DE = \frac{1}{4} DB$; the portion $ADCE$ is cut off. Find the centre of gravity of the remainder.

4. Describe the machine known as the 6 wheel and axle.

The radii of the wheel and axle are 'a'
and 'b' respectively, the weight consists of a
cage of weight W with a man of weight W,[1]
in inside it, who supports the system by
holding the rope that passes over the wheel.
Find the tension he produces in the rope.

5. Explain the term 'co-efficient of fric-   6
tion.'

A uniform beam, of weight W, leans
against a rough vertical wall, its lower end
resting on a rough horizontal plane. If the
co-efficients of friction of the wall and plane
respectively be $\frac{1}{3}$ and $\frac{3}{7}$, prove that the
limiting inclination of the beam to the
horizontal is $45°$ and find the pressure of
the beam on the wall.

6. Prove the formula $S = \frac{1}{2} ft^2$ for a body   5
moving from rest with uniform accelera-
tion.

A body slides from rest down a smooth
inclined plane; in the second second of its
motion it describes a distance of twenty-four
feet; find the inclination of the plane to the
horizontal.

7. Find the range on an inclined plane
of a projectile, the velocity and angle of
projection being given.

The range of a projectile down a plane
inclined at $45°$ to the horizontal is three
times its range up the same plane; prove
that the range on a horizontal plane through

the point of projection is twice the greatest height attained, the initial velocity and the elevation being the same in all three cases.

8. In the case of the direct impact of 6 two bodies prove that the total momentum is unaltered.

A body impinges directly upon another body at rest, and is itself reduced to rest by the impact; if half of the initial kinetic energy is destroyed in the collision, find the elasticity.

9. Explain the terms Kinetic Energy 6 and Work.

What units of their measurement are ordinarily used? State any relation between Kinetic Energy and Work in the case of a body acted on by any forces. A wagon, weighing 5 tons, is allowed to run down a slope, half a mile long, the gradient being 1 in 80, after which it proceeds on the level. If the resistance due to air and friction be 21 lbs. per ton throughout the motion, how far will it run on the level before coming to rest?

PHYSICS.

First Paper.

N. B.—*Only* eight *questions to be attempted. The questions are of equal value (5 marks each.)*

1. Define Young's modulus and describe how it can be experimentally determined in the case of a wire.

2.   Describe and explain the action of an air pump.

3.   (a) A tall jar provided with a tap at the side, near the bottom, is filled with water, placed on a large cork, and floated in a tank. Explain what will happen when the tap is opened.

(b) Two barometer tubes of different diameters are filled with mercury and inverted in a basin containing mercury. Will the mercury column in the tubes stand at the same height? Give reasons for your answer.

4.   Describe any experiment which you have performed to determine the co-efficient of expansion of a metal rod, pointing out the errors involved and the precautions taken by you to eliminate them.

5.   Enunciate Newton's Law of Cooling. How will you verify it experimentally?

6.   The diameter of the capillary tube of a Bunsen Ice Calorimeter is 1·4 mm. On dropping into the instrument a piece of metal whose temperature is 100°C and mass 11·088 grs. the mercury thread is observed to move through 10 cms.   Calculate the specific heat of the metal.

(Give latent heat and density of ice to be 80° and 0·9 respectively and $\pi = \dfrac{22}{7}$).

7. (a) Water placed in an earthen pitcher gets cold during dry summer days, specially if they happen to be windy; while there is only a slight lowering of temperature during the rainy season. Explain the above temperature.

(b) Two barometer tubes are filled with mercury. Dry air is introduced into the vacuum of one and a little water into the other so as to leave the space unsaturated. Discuss the effect observed on the mercury columns if the tubes are pushed down into a deep cistern containing mercury.

8. Explain how you will utilise two lenses of focal lengths 14 cm. and 1 cm. to make a telescope. Draw a diagram to show the course of rays in the instrument and calculate its magnifying power.

9. Define "dispersion." and "dispersive power." How will you combine two lenses to produce an achromatic combination? Why is it found necessary to use such combinations?

10. A luminous source and a screen are placed at a fixed distance apart along a scale and a convex lens can be moved between them. Explain how you will utilise this arrangement to determine the focal length of the lens. If a and b be the sizes of the image for the two positions of the lens, show that the size of the object is $\sqrt{ab}$.

11. Describe a method for determining the refractive index of a liquid.

A man is looking vertically downwards into a tank filled with water, the bottom of which appears to be at a depth of 4 feet. What is the actual depth, the refractive index of water being 1·33 ?

———

SECOND PAPER.

Not more than eight *questions to be attempted.*

All questions are of equal value [5 *marks each.*]

✓ 1. How does the frequency of the fundamental vibration of a stretched string depend upon its length, its tension and its mass per unit length ?

A wire 50 cms. long and of mass 6·5 grams, is stretched so that it makes eighty vibrations per second. Find the stretching force in grams-weight.

How would you double the frequency—

(i) by changing the length of the wire (ii) by changing the tension, in the above case ?

✓ 2. Explain the production of beats when two forks of nearly the same pitch are sounded together. How would you determine which fork had the greater vibration number ?

3. Explain the principle of resonance.

A tuning-fork which is octave to an organ pipe can make it "speak" if the pipe is open but not if it is a close pipe. Explain the reason for this.

√ 4. What is meant by the magnetic moment of a magnet? A bar magnet whose poles are 10 cms. apart is placed in the meridian with its north-seeking-poles to the north. A neutral point is found 10 cms. due east of the centre of the magnet. Calculate the moment of the magnet given that H is equal to 0·35 *C.G.S.* units.

√ 5. Explain the method of comparing the horizontal magnetic force at two different places by means of the vibration magnetometer. Shew how the total intensity of the earth's magnetic field can be calculated if the intensity of the horizontal field and angle of dip are known.

√ 6. How would you shew by experiment (i) that the total quantity of electricity induced by a given charge is equal and opposite to the given charge? (ii) that the charge lies wholly on the surface of an electrified conductor?

√ 7. Obtain a formula which will enable you to calculate the resistance of a number of wires in parallel.

Three wires of resistance 2, 6 and 12 ohms respectively are connected in parallel and are inserted in a circuit with a cell and tangent galvanometer. The deflection is 60° the 2-ohm wire is removed and the deflection btcomes 45°. Calculate the resistance of the galvanometer. [Neglect the resistance of the cell.]

√ 8. Explain clearly how you would determine by means of the metre-bridge the resistance of a coil of wire.

9. How would you determine which is the positive and which the negative terminal of a voltaic battery by the (a) magnetic, (b electrochemical effects of the current ?

10. Describe an electrical method of determining the mechanical equivalent of heat.

11. Describe an accumulator and explain how you would charge it.

Or,

Describe the thermopile and explain the principle on which it works.

CHEMISTRY.

First Paper.

1. (a) State Dulong and Petit's law 5 and explain its value in the determination of atomic weights.

(b) How would you carry out any two of the following operation in the laboratory ?

(i) Remove hydrochloric acid gas from a mixture of this gas and chlorine ;

(ii) Prepare dry ammonia gas from liquor ammonia ;

(iii) Remove carbon monoxide from a mixture of methane and carbon monoxide.

2. What are the natural sources of 6 phosphorous ? Describe how the element is commercially manufactured and mention some of the uses to which phosphorous and its

compounds are put. How can orthophosphoric acid be prepared from phosphorous ?

✓ 3. Describe and explain with equations 6
the changes which take place when :—

(a) Chlorine is passed into a solution of
potassiumiodine.

(b) Sulphurous acid gas is passed into a
solution of iodine.

(c) Carbon dioxide is passed into caustic
potash solution.

✓ 4 (a) What is the nature of difference 6
between dissociation and decomposition of
substances ? Illustrate with examples.

✓ (b) How can the following be differentiated from each other :—

(1) acetylene from ethylene ;

(2) acetyl chloride from acetic anhydride.

✓ 5. How can a pure anhydrous sample of 5
formic acid be prepraed in the laboratory ?
In what important respect does it differ from
homologues ?

6. 2·4 litres of air at N. T. P. are shaken 6
up with 50 c.c. of centi normal barium hydroxide solution. After removal of the precipitate, the remaining alkali requires 32 c.c. of
an acid solution prepared by making up to a
litre I c.c. of a hydrochloric acid solution of
1·18 specific gravity, and containing 35 per
cent. of pure acid. Find the amount of carbon
dioxide per 100,000 volumes of air.

7. (a) Acetone and methyl alcohol, mixed   6
together in about equal proportions, are given
to you.   How would you separate the two ?

(b) How would you prepare sodium nitrite
from sodium nitrate, and iodoform alcohol ?

SECOND PAPER.

[N.B.—*Candidates are required to answer only*
seven *in all, viz. Qs. 6, and 7 and also any* five *of
the remaining* seven *questions.*]

√ 1.   A metal M forms two chlorides.   One   5
contains 35·86 per cent of chlorine and 64·14
per cent. of M ; the other 52·79 per cent. of
chlorine and 47·21 per cent. of M. Use these
numbers to illustrate the law of combination
in Multiple Proportions.

√ 2.   Give an account of the manufacture   5
of sodium carbonate from common salt by
the " Ammonia-Soda " process, stating the
reaction as fully as you can.

√ 3.   Describe the preparation of approxi-   5
mately pure specimens of :—

   (a) Lead chloride from lead monoxide ;

   (b) Cupric oxide from copper sulphate.

Give equations to represent the chemical
which occur in the making of these prepara-
tions.

4.   A blast furnace is charged at the top   5
with haematite, coke and limestone, and

melted slag and cast-iron are drawn off at the bottom ; describe briefly the principal changes which occur in the furnace.   How does steel differ from cast-iron ?

5. State what happens when :—

(a) Crystals of lead nitrate are heated in   5 an open test-tube ;

(b) A solution of caustic soda is gradually added to a solution of zinc sulphate ;

(c) Metallic lead is acted upon by strong nitric acid ;

(d) Nitric acid is added to a warm solution of ferrous sulphate.

Give equations to represent the reactions which occur in the above experiments.

6. Give your reasons for classifying cal-   7 cium with strontium and barium in the Periodic Table of the Elements. How would you distinguish between specimens of [a] calcium carbonate, [b] stronium carbonate, and [c] barium carbonate, each in the form of a white powder ?

7. (a) An aqueous solution   contains either aldehyde. ethyl alcohol or   acetone. How would you   distinguish the compound present ?

(b) How is acetyl chloride acted upon by each of the following substances : [1] water, [2] ethyl alcohol, [3] ammonia, [4] sodium acetate ?   Give equations.

8. How would you prepare pure chloro- 5
form in the laboratory ? How would you
show the presence of chlorine in chloroform ?

If a small quantity of pure chloroform
is exposed to sunlight in a large colourless
glass bottle, would the chloroform still re-
main pure, and if not, how would you prove
it ?

9. By what properties and reactions 5
would you distinguish a solution of cane-sugar
from a solution of grape-sugar.

How would you demonstrate the produc-
tion of grape-sugar from cane-sugar and
starch respectively :

BIOLOGY.
First Paper.
(Zoology.)

[*Only five questions should be attempted. Question
No. 1 is compulsory. Answers should be illustrated
with suitable diagrams.*]

1. Make a neat and labelled diagram of 8
a vertical section of the eye of a vertebrate,
giving all details. (A description of the
section is not required.)

Why is there a third eye-lid in Frog
and Rabbit while it is practically absent in
Man ?

2. Give a clear account of the most im- 8
portant functions of the liver in a vertebrate.

Make a labelled sketch showing all the blood-
vessels that enter or leave the liver in a
Rabbit.

3.   Give an illustrated account of the   8
external features of a Cockroach.

4.   Give an account of the early develop-   8
ment of Frog up to the formation of the three
primary germlayers.   Enumerate the organs
derived from the third germ-layer (meso-
derm.)

5.   Write illustrated notes on the follow-   8
ing :—

Sporozoite, nephridium, chromosome,
parasphenoid, pupa, lamina terminalis,
maturation and metazoa.

6.   How exactly is locomotion effected in   8
Hydra, Earth-worm, Frog and Rabbit ?

7.   Describe the alimentary canal of the   8
earthworm *you have dissected* indicating the
anatomical peculiarities of the various regions.

8.   Describe the genito-urinary system of   8
a Frog, and also give an account of the time
and mode of fertilization of the ova.

Second Paper.
(Botany.)

[*Only* **five** *questions to be answered.*]

1.   Write short descriptive notes on :—
(a) a spike, (b) a catkin, (c) a cin-
cinus, (d) a corymb, (e) a pome, and (f) any

aggregate fruit. Mention some familiar examples of each.

2. How would you detect under the   8 microscope the presence of the following substance in vegetable tissues ?—

[a] Protein grains, [b] Fatty oils, [c] Lignin and [d] Suberin.

3. Make instructive sketches in order to   8 illustrate the distribution of sclerenchyma, collenchyma, phlœm and xylem in such Mono and Dicotyledonous stems as you have studied.

4. Sketch the female gametophyte of an   8 Angiosperm and write a brief account of the changes that follow fertilization and lead to the formation of the embryo in the case of Dicotyledon.

5. Mention at least three familiar exam-   8 ples of enemohilous flowers. How do such flowers differ from those that are polinated by insects ?

6. Write a short description of the   8 sporophyte of a *fern*. State what you know of the relative importance of the gametophyte in the life history of a moss and a fern.

7. What do you know of the follow-   8 ing :—Grand period of growth, Heliotropism and " sleep movements " ?

8. State what you know of the usual 8 constituents of the food of a green plant and their sources. How would you prove experimentally the importance of any one of them?